TECHNOLOGY DEPT.

FOOD INDUSTRIES

IC LIBRARY
4 1943
TROIT

● FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

High-vacuum concentrators

DECEMBER, 1943

What To See at The Chemical Show

How To Get Food Plant Priorities

Automatic Control Of Dehydration

The Function of The Food Engineer

Electronics In the Food Plant

Dehydration Plant With Innovations

Infrared Lamps Speed Fish Drying

McGRAW-HILL PUBLICATION

FOR POST WAR ECONOMY —

PORTER SIDE-ENTERING MIXER

Begin now to standardize on

PORTER

Better Built

EQUIPMENT

PORTER PORTABLE MIXER

PORTER FLANGE-MOUNTED MIXER

PORTEREDUCER MIXER
Speeds as low as 1/2 r. p. m.

PORTER
Better Built
Equipment
Established 1866

PROCESS EQUIPMENT DIVISION:
Agitators, Mixers, Blenders, Autoclaves, Kettles, Pressure Vessels, Driers, Ball and Pebble Mills.

LOCOMOTIVE DIVISION:
Diesel, Diesel-Electric, Electric, Steam, and Fireless Steam Locomotives.

QUIMBY PUMP DIVISION:
Screw, Rotex, Centrifugal, Chemical, and Steam Pumps.

ORDNANCE DIVISION:
Projectiles, Heavy Forgings, Breech Blocks.

H. K. PORTER COMPANY, Inc.

GENERAL OFFICES: PITTSBURGH, PENNSYLVANIA

FACTORIES:

PITTSBURGH, PA.
BLAIRSVILLE, PA.
NEWARK, N. J.
NEW BRUNSWICK, N. J.

TECHNOLOGY DEPT.

DECEMBER FOOD TECHNOLOGY

PACKAGING
Shortenings in Glass 137
Waterproof Labeling 137

VITAMINS
Vitamin Recovery During Flour Milling.. 137

STORAGE
Ripening of Apples 137

BAKING
Bakery Tests with Frozen Egg Whites.... 137

ENGINEERING
Electronics in the Food Plant 76
What Is a Food Engineer? 79

MEAT
Measuring Juiciness 138

DAIRY PRODUCTS
Standards for Homogenized Milk 138
Cheese Starters 138
Butter Flavor Defects Due to Bacteria.... 139
Evaporated Milks with High Total Solids. 139
Milk and Cream Nomograph 75

DEHYDRATED FOODS
Infrared Speeds Fish Drying 80
New Dehydration Plant Handles Record Quantities 82

QUALITY CONTROL
Automatic Control of the Dehydration Processes 89

FATS AND OILS
Commercial Antioxidant 140

THE COVER

For concentrating citrus juice in its modern factory in Los Angeles, Mission Dry Corp. employs high-vacuum stainless steel evaporators, shown on the cover of this issue. This operation shows how close a parallel sometimes exists between the equipment used in the food processing field and that employed in the chemical processing industries.

EVERY MONTH

Editorial 57
Talk of the Industry 58
Automotive 86
New Packages and Products 98
The Food Industry News 103
Men, Jobs and Companies 121
Food Equipment News 125
Just Off the Press 131
Patents 132
Books 133
Food Technology—Abstracts 137
Formulas 143

FOOD INDUSTRIES

M. A. WILLIAMSON, *Publisher* — LAURENCE V. BURTON, *Editor*

E. S. STATELER, *Associate Editor, Chicago* — G. L. MONTGOMERY, *Associate Editor*
F. K. LAWLER, *Managing Editor* — HILDA G. HOWE, *Art Editor*
GRACE HIGHTOWER, *Assistant Editor* — ELIZABETH B. SHAW, *Assistant Editor*
S. T. Henry, Spruce Pine, N. C. — R. S. McBride, Washington, D. C.
Earle Mauldin, Atlanta, Ga. — Paul Wooton, Washington, D. C.
N. A. Bowers, San Francisco, Calif.

VOL. 15, No. 12 — DECEMBER, 1943

SPECIAL FEATURES

This Exposition Can Aid in Postwar Planning 61
Chemical Exposition exhibits of interest to food men

What You Must Do To Get Food Plant Equipment *By W. B. Spooner, Jr.* 69
Authoritative instructions on priority procedures

PRODUCTION

Milk and Cream Nomograph ..... *By D. S. Davis* 75
A time-saving tool for dairy-plant calculations

ENGINEERING

Electronics in the Food Plant 76
How electronic devices perform their unique functions

What Is a Food Engineer? ..... *By G. L. Montgomery* 79
An explanation of the functions of the food engineer

Automatic Control of the Dehydration Processes *By F. K. Lawler* 89
Types of controllers needed, with application diagrams

DEHYDRATED FOODS

Infrared Speeds Fish Drying ..... *By L. V. Burton* 80
Gorton-Pew Fisheries builds dryer in own shops

New Dehydration Plant Handles Record Quantities *By C. R. Havighorst* 82
And this West Coast plant has important innovations

MANAGEMENT

Don't Let It Happen To Your Trucks 86
Take care of motor vehicles—next six months critical

British Beverage Industry Consolidates Production *By J. W. Towns* 88
Companies pool manpower and equipment to effect savings

★ ★ ★ CHANGE OF ADDRESS ★ ★ ★

McGRAW-HILL PUBLISHING COMPANY
330 West 42nd Street, New York 18, N. Y.
Director of Circulation:

Please change my address on "Food Industries"

From .....

.....

To .....

.....

Signed .....

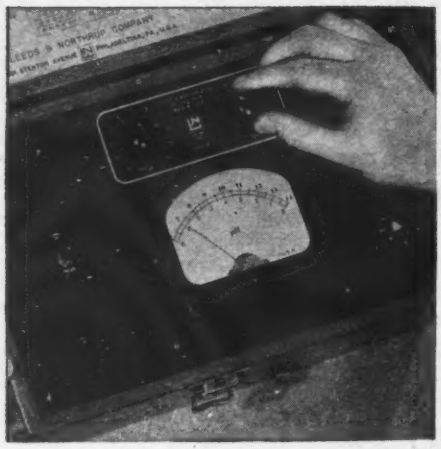
McGRAW-HILL PUBLISHING COMPANY, INC., James H. McGraw, Founder and Honorary Chairman. PUBLICATION OFFICE: 99-129 North Broadway, Albany 1, N. Y. Return postage guaranteed. EDITORIAL AND EXECUTIVE OFFICES: 330 West 42nd Street, New York 18, N. Y.

BRANCH OFFICES: 520 North Michigan Ave., Chicago, 11; 68 Post St., San Francisco 4; Aldwych House, Aldwych, London, W.C. 2; Washington 4; Philadelphia 2; Cleveland 5; Detroit 2; Los Angeles 3; St. Louis 1; Boston 16; Atlanta 3; Ga.

JAMES H. McGRAW, Jr., President; HOWARD EHRLICH, Executive Vice-President; MASON BRITTON, Vice-President; CURTIS W. McGRAW, Vice-President and Treasurer; JOSEPH A. GERARDI, Secretary, and J. S. BLACKBURN, Jr., Director of Circulation.

CABLE ADDRESS: "McGraw-Hill, N. Y." Member A.B.P. Member A.B.C.

Contents indexed monthly in the Industrial Arts Index. Copyright, 1943, by McGraw-Hill Publishing Company, Inc.



Three simple adjustments make the instrument ready for measurements. First, instrument zero is adjusted with a single knob.

Electrode calibration is compensated by a second knob. Only the temperature compensator need be reset for later tests.

Manual temperature compensator, set to solution temperature, eliminates computations, thus saving time and avoiding errors.

MEASURING pH WITH GLASS ELECTRODES?

Here, at $160, is our Indicator which Sets New Standards of Speed and Convenience

Although simplified and stripped to essentials for low cost and easy, rapid operation, L&N's Glass-Electrode pH Indicator has a limit of error of only ±0.1 pH. Measurements are made by simply pouring the sample into the beaker and reading pH, directly.

Outstanding advantages include:

1. Full accuracy in atmospheres of 95% relative humidity up to 30 C.
2. Manual temperature compensator eliminates computations.
3. Instrument is adequately shieded from electrical disturbances.
4. The double range, covering 0.8 and 6-14 pH, provides a convenient overlap of 2 pH . . . a desirable feature for titrations.
5. The calibrated scale is longer than in any comparable pH indicator.
6. The mahogany case stands severe use; is not affected by high humidity.
7. Dry cells have their own compartment; can't corrode wiring, etc.
8. A whole end of the box swings out, leaving the electrodes and sample holder easily accessible.
9. Factory sealed and filled electrodes are highly stable.
10. Sample cup is a 50 ml beaker.
11. Fifteen-inch shielded leads permit electrodes to be used outside the case, for titration as well as pH.
12. Only 3 simple preliminary adjustments are necessary. Each is independent of the other.
13. Maintenance is negligible, consisting of adding KC1 to the reference electrode salt bridge every 6 or 8 weeks, cleaning the electrodes occasionally, and replacing batteries at infrequent intervals.

This Indicator is moderately priced for quality at $160.00. It comes complete with everything necessary for pH measurements.

Full details in Catalog E-96(2)

A Slogan For Every American

Jrl Ad E-96(19)

LEEDS & NORTHRUP COMPANY, 4912 STENTON AVE., PHILA., PA.

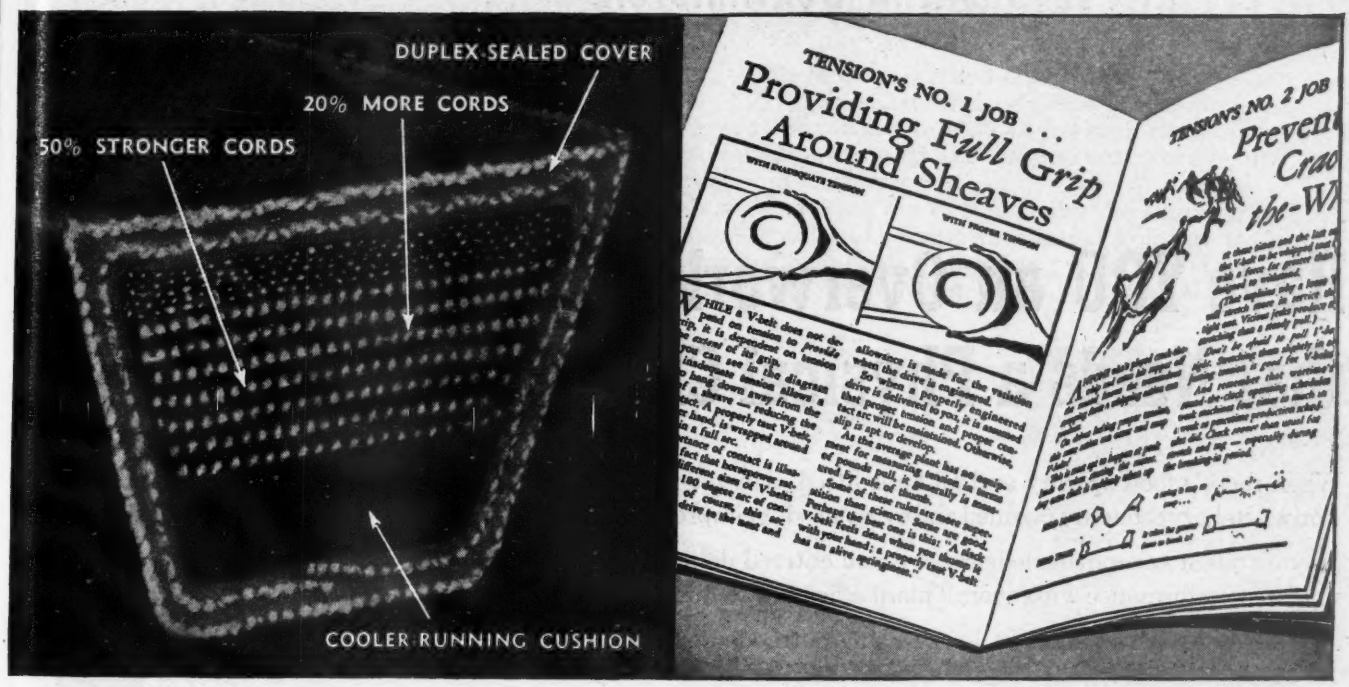
LEEDS & NORTHRUP

MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

FOOD INDUSTRIES is published monthly. Price 35c per copy. Allow at least ten days for change of address. Publication Office, 99-129 North Broadway, Albany, N. Y. All communications about subscriptions should be addressed to the Director of Circulation, Food Industries, 330 West 42nd St., New York, N. Y. Subscription rates: United States and Possessions, Mexico, Central and South American countries, $3 a year, $4 for two years, $5 for three years. Canada, $3.50 a year; $5 for two years; $6 for three years (payable in Canadian or U. S. Funds). Great Britain and British possessions, 30 shillings for one year, 60 shillings for three years. All other countries, $5 a year, $8 for two years, $10 for three years. Entered as second-class matter, Aug. 17, 1936, at Post Office, Albany, N. Y., under act of March 3, 1879.

War Slogan FOR V-BELTS— "Make 'em Last!"

(HERE ARE TWO WAYS TO DO IT . . .)



1 **BUY THE BEST BELTS . .** Texrope Super-7's new design-against-wear gives maintenance a head start. The 20% more cords — made 50% *stronger* by the new Flexon process — combat stretching, give Super-7's extra pulling power. Revolutionary new shock-absorbing cushion of special cool-running rubber eases pulling cords around sheaves. Tough, new Duplex-Sealed cover protects inner belt structure against grit, grime and moisture. When you *do* need new V-belts, *invest in the best* — Texrope Super-7!

2 **USE THE BEST CARE . .** Whatever brand of V-belts you now use, you can make them last *longer* by following the tips in Allis-Chalmers' free handbook: "Plain Facts on Wartime Care of Rubber V-Belts." How V-belt anatomy affects maintenance . . . what determines V-belt "life expectancy" . . . here is the full story, packed with practical data — fully illustrated. The new handbook contains no advertising, applies to *all* makes. Tear off the coupon below and send for *your* copy of this valuable new handbook today!

ALLIS-CHALMERS

TEXROPE SUPER-7 V-BELTS

WE WORK FOR VICTORY — WE PLAN FOR PEACE

Trade mark registered U. S. Patent Office. Texrope Super-7 V-Belts are the result of the cooperative research and design genius of two great companies—Allis-Chalmers and B. F. Goodrich—and are sold exclusively by Allis-Chalmers. Available in all sizes ½ h.p. to 2,000 h.p.

ALLIS-CHALMERS MFG. CO.
Milwaukee, Wisconsin
Gentlemen:
Yes, I would like to receive free of charge a copy of your "Plain Facts on Wartime Care of V-Belts".

(Name) _____

(Title) _____

(Company) _____

(Street Address) _____

(City and State) _____ A-1606-I

IT'S GETTING ROUND TO INVENTORY TIME. WE OUGHT TO TAKE STOCK OF WHERE WE STAND

. . . AND THE PLACE TO BEGIN IS THIS PATCHED-UP PLANT. WE NEED A COMPLETE REFRIGERATION CHECK-UP. LET'S CALL IN WORTHINGTON.

Have YOU an Overworked Plant that Needs a Physical Check-up?

When there's food aplenty and all bans lifted, will you be ahead of competition with every economy planned and every product improvement safeguarded?

In your plant equipment ledger have you entered debits and credits against machine performance with overall plant efficiency in mind?

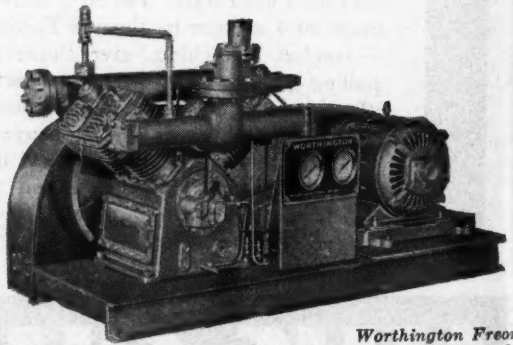
And have you given thought to replacing outmoded or worn-out machinery . . . expanding facilities for post-war business?

Yes, the time is at hand when an inventory should be taken—when the "Clearing House" of industry must make an accounting of individual plant preparedness. And refrigeration will be the core of the situation.

The double pressure of supplying food to our armed forces and meeting civilian needs has perhaps strained machinery beyond the endurance limit.

That's where Worthington's long experience and recent developments, applied *now* to a survey of your needs, would be of material advantage. Why not call our nearest office into consultation?

CA3-44



Worthington Freon Refrigeration Units are available in sizes to 50 H. P.—for cold storage, low temperature freezer duty, or for air conditioning.

WORTHINGTON PUMP AND MACHINERY CORPORATION, HARRISON, N. J.

District Offices and Representatives in Principal Cities

WORTHINGTON

Refrigeration

AND AIR CONDITIONING

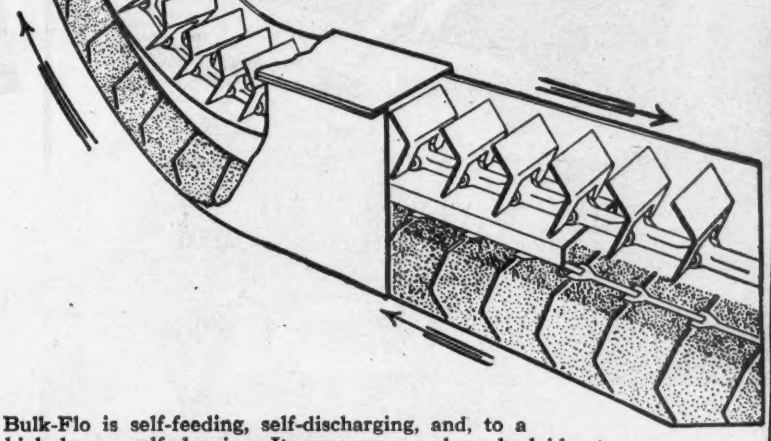
The Protection of Modern Packaging In Conveying Materials

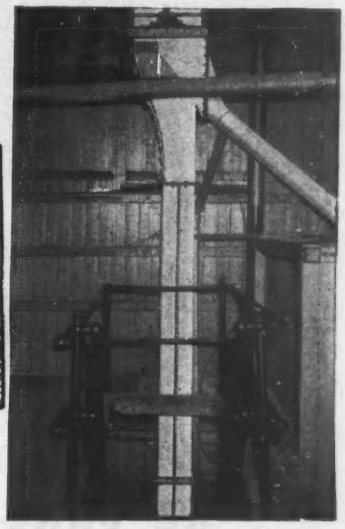
Bulk-Flo

ELEVATOR-CONVEYOR-FEEDER

This modern method of handling flowable, granular, crushed, ground, or pulverized materials of a non-abrasive, non-corrosive nature gives you dust tight operation. It minimizes breakage and degradation, prevents leakage, and reduces explosion and fire hazards.

The flights, which extend across practically the entire section of the casing, form a series of compartments that hold the material. Each compartment is in itself a veritable package assuring cleanliness, freedom from contamination, and from exposure.





Bulk-Flo is self-feeding, self-discharging, and, to a high degree, self-cleaning. It saves space and can be laid out to carry vertically, horizontally, around corners, along curves, and on slants of any degree. Write for Book No. 1975 to get the complete story and to see the possibilities of Bulk-Flo in your service.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Toronto 8.

Offices, warehouses and distributors in principal cities. 9325

The above illustration shows head end of compact, encased, Link-Belt Bulk-Flo elevator with chute to bin in sugar bagging department of a Michigan beet sugar company. Capacity 25 tons per hour. One of the important results of this handling is that the sugar crystals retain their sparkle and breakage of crystals is practically nil. Operates either fully or partially loaded and cleans itself out at the end of a run.

ON PRODUCTION LINE

OR FRONT LINE . . . . .

"RATIONS" PLAY A VITAL PART

A LADY-LIKE appetite is out, when a woman is doing a man's job on the production front in wartime. Hearty, nourishing food, and plenty of it, for those who work or fight is basic to victory.

In the great food plants of the nation, Pneumatic Packaging and Bottling Machines are turning out whole armies of nourishing foods—to be shipped to battle fronts and war production centers the world over . . . . Only through ample rations can brain, muscle, and the will-to-win be kept at victory pitch.

Pneumatic Machines are packaging vitally-needed medicines, too, with unprecedented speed and precision. While at the home plant today, Pneumatic is largely engaged in producing essential ordnance equipment. In such times, the sound design, accurate engineering, and reliable construction of Pneumatic Machines are put to enormous tests—and not found wanting.

PNEUMATIC SCALE CORPORATION, LTD., 91 Newport Avenue, North Quincy 71, Massachusetts
New York, Chicago
. San Francisco .
. Los Angeles .

PNEUMATIC
PACKAGING & BOTTLING MACHINERY

If it's a packaging problem, consult Pneumatic first. Semi-automatic and fully-automatic machinery.

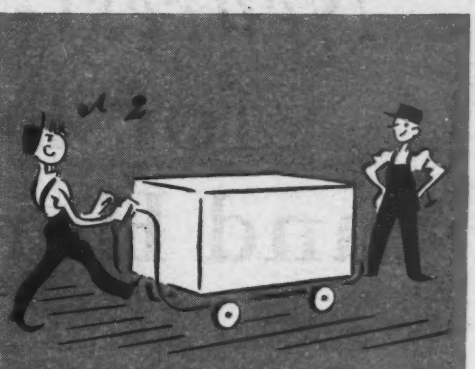
CARTON FEEDERS
BOTTOM SEALERS
LINERS
WEIGHERS
TOP SEALERS
TIGHT WRAPPERS
also
SPECIAL COMBINATION PACKAGING UNITS

FIGHT FRICTION!

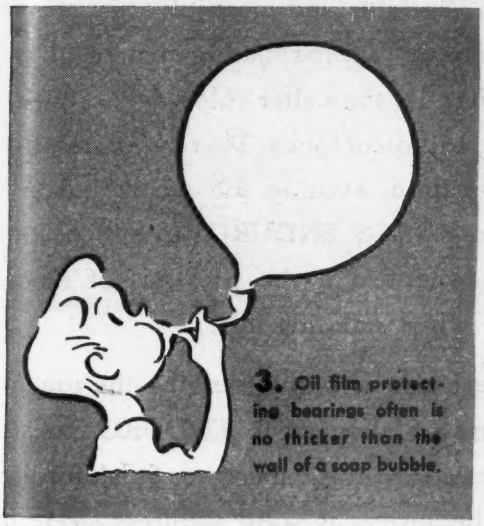
It's Electric Motor Enemy No. 4...

in Allis-Chalmers' new "Guide to Wartime Care of Electric Motors".

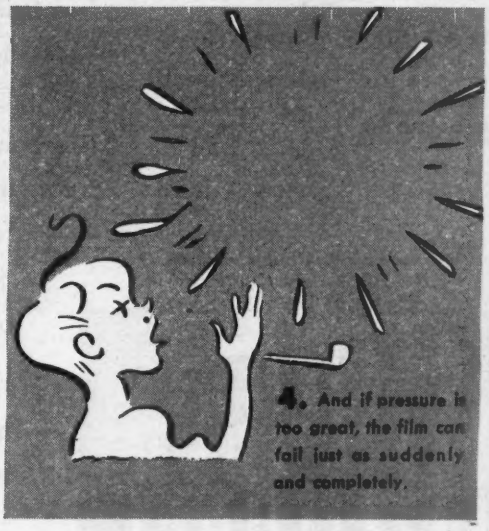
1. Like a motor without oil. Simple! Yet every day hundreds of workers overlook the importance of adequate motor lubrication.



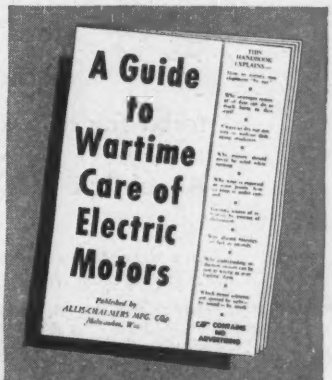
2. Like a motor with oil. Pictures like these make motor maintenance easy to put across in training new employees.



3. Oil film protecting bearings often is no thicker than the wall of a soap bubble.



4. And if pressure is too great, the film can fail just as suddenly and completely.

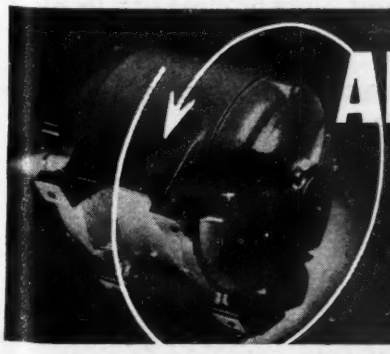


5. Send for your free copy of this interesting, fully-illustrated new book today!

ONE OF A MOTOR'S most dangerous enemies is friction. In peacetime, instructions for guarding against it were based on 8-hour-day, 6-day-week operation. Today, with motors working up to *3 and 4 times* as many hours a week, those instructions are dangerously obsolete!

To help put U. S. motor maintenance on an efficient wartime footing, Allis-Chalmers has published "Guide to Wartime Care of Electric Motors". This valuable book explains the *9 main enemies* of electric motors . . . tells you how to fight them. Its recommendations are simple and practical . . . ideal for training new men or as a review for experienced men. Book is fully illustrated with stimulating, understandable sketches like those shown above—*contains no advertising.* Over 100,000 copies in use by industry and armed forces. Send for your *free* copy today! ALLIS-CHALMERS MFG. CO., MILWAUKEE 1, WIS.

A 1658



ALLIS-CHALMERS MOTORS

When you do need new motors, look into the strength, solidity and all-around protection of the new "Safety Circle"—protected top, sides, ends and bottom.

A-C WE WORK FOR VICTORY WE PLAN FOR PEACE

Today's *Nearest-To-Perfect* Material for Food Processing and Handling Equipment

Of all the materials used for the fabrication of food processing and handling equipment, none can offer the combination of qualities provided by stainless steel. It is the finest "all-around" material made today for such applications.

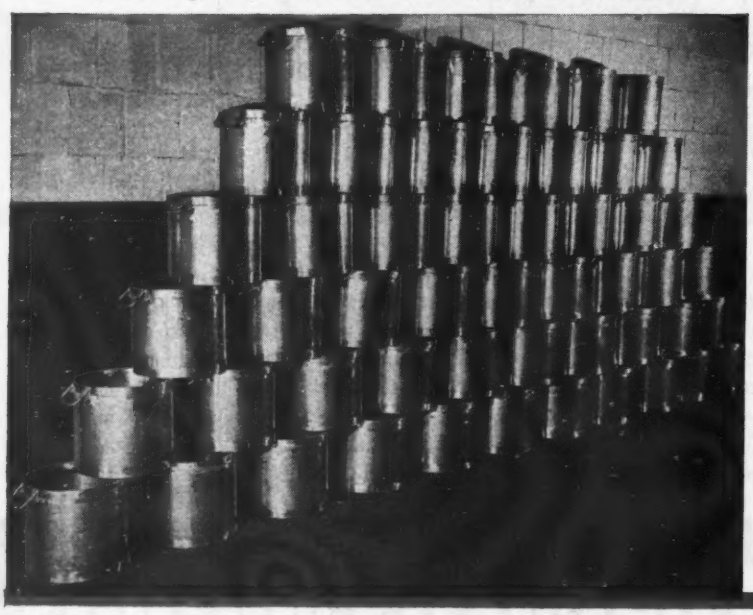
Republic ENDURO is a time-tested stainless steel—proved by many years of service in the food industries.

Here in a single material is high resistance to fruit, vegetable and meat juices—a chemical neutrality approximating that of glass. ENDURO does not alter color, flavor, purity or composition of foods. There is no metallic contamination, even in the most "finicky" foods. And ENDURO does not corrode either in the presence of foods or when standing idle.

Here also is high strength—the toughness of alloy steel. ENDURO resists wear. It retains its lustrous finish for life—because it is solid stainless steel all the way through. It resists oxidation and scaling at high temperatures. Its creep strength is high.

Here, too, is sanitation and ease of cleaning. The hard, non-porous surface is easily and quickly cleaned—in most

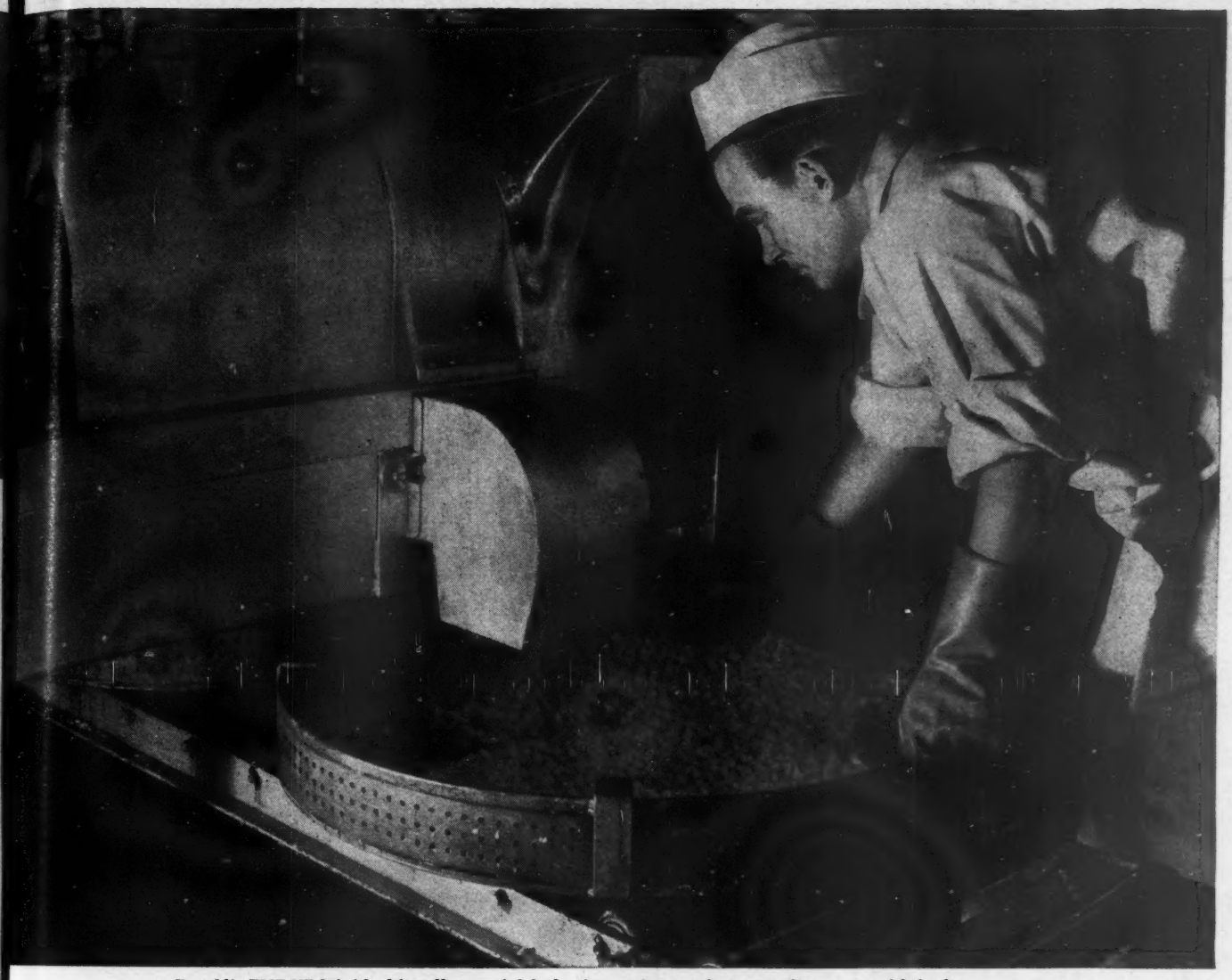
Extra strength was provided in these soup-handling containers by fabricating them from ENDURO 18-8-HT—a high tensile analysis.



REPUBLIC *Enduro*

*Reg. U. S. Pat. Off.

Other Republic products include Ex-L-ite Tin Plate—Pipe—Sheets—



Republic ENDURO is ideal for all types of dehydrating equipment that comes in contact with foods.

cases simply by water flushing and wiping. There is no retention of minute particles in the surface to contaminate the next batch. Ordinary cleaning compounds may be used to remove greases or sticky substances without harm.

Here is a material that lasts indefinitely—cuts cleaning time and costs—speeds up production — protects product quality — cuts maintenance and replacement costs.

Before you order new food processing or handling equipment for the future, ask your fabricator or write us for more information on Republic ENDURO Stainless Steel.

REPUBLIC STEEL CORPORATION
Alloy Steel Division, Dept. FI
Sales Offices • Massillon, Ohio
GENERAL OFFICES • • CLEVELAND 1, OHIO
Berger Manufacturing Division • Culvert Division
Niles Steel Products Division • Steel and Tubes Division
Union Drawn Steel Division • Truscon Steel Company
Export Department: Chrysler Building, New York 17, New York

STAINLESS STEEL

Upson Bolts, Nuts and Rivets—Electrunite* Condenser and Heat Exchanger Tubes.

Continuous! Automatic! No Labor!

(a) Primary stage Hersey Dehydrator removing 68% of the moisture.

(b) Four finishing stage Hersey Dehydrator.

(c) Dried potatoes being discharged from a finishing stage Dehydrator.

HERSEY
VEGETABLE DEHYDRATOR

For potatoes, carrots, beets and all root vegetables

CONTINUOUS IN OPERATION taking the product in continuous flow from the last washer and discharging without further attention to the packaging room

COMPLETELY AUTOMATIC in movement of product, temperature control and cycle time NO OPERATORS NEEDED

UNIFORM TREATMENT because the product is in motion and is being turned over constantly Every particle receives exactly the same treatment

Constructed of

NON - STRATEGIC MATERIALS such as wood, cast iron, etc., wherever possible

• ***Send for Catalog Today***

HERSEY MANUFACTURING CO.

DRYING ENGINEERS FOR MORE THAN 60 YEARS

381 E STREET • SOUTH BOSTON, MASS.

What's Your Pump I.Q.?

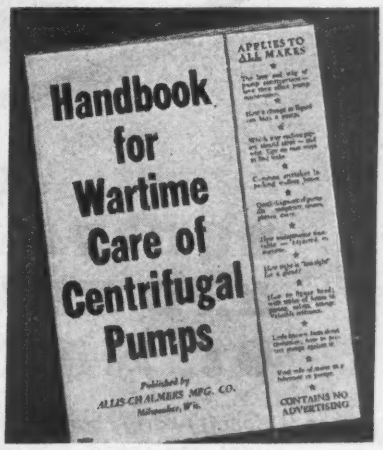
Suggestion — this new book is particularly helpful for training new men to make present pumps last. It applies to all makes — contains no advertising. When you *do* need new pumps, look into the extra efficiency, ruggedness and long life built into Allis-Chalmers centrifugal pumps . . . the famous "Electrifugal" . . . and all types for every purpose.

ALLIS-CHALMERS
MILWAUKEE

WE WORK FOR VICTORY — WE PLAN FOR PEACE

HOW ABOUT A SHORT "REFRESHER" COURSE IN . . . ALIGNMENT PROBLEMS, FIGURING HEAD, PREVENTING CAVITATION, ETC.? SEND FOR ALLIS-CHALMERS' NEW PUMP MAINTENANCE GUIDE!

TODAY, with pumps working harder than ever and replacements more difficult to obtain, you can't afford to take chances on maintenance. That's why Allis-Chalmers has published its new "Handbook for Wartime Care of Centrifugal Pumps".



In it a pump is built, step by step. As each new part is added we learn what it does, how it does it, how it must be cared for. Tear off coupon below and send for your *free* copy today!

ALLIS-CHALMERS MFG. CO.
Milwaukee 1, Wisconsin

Gentlemen:

Yes, I would like to receive, *free of charge*, a copy of your "Handbook for Wartime Care of Centrifugal Pumps".

(Name)

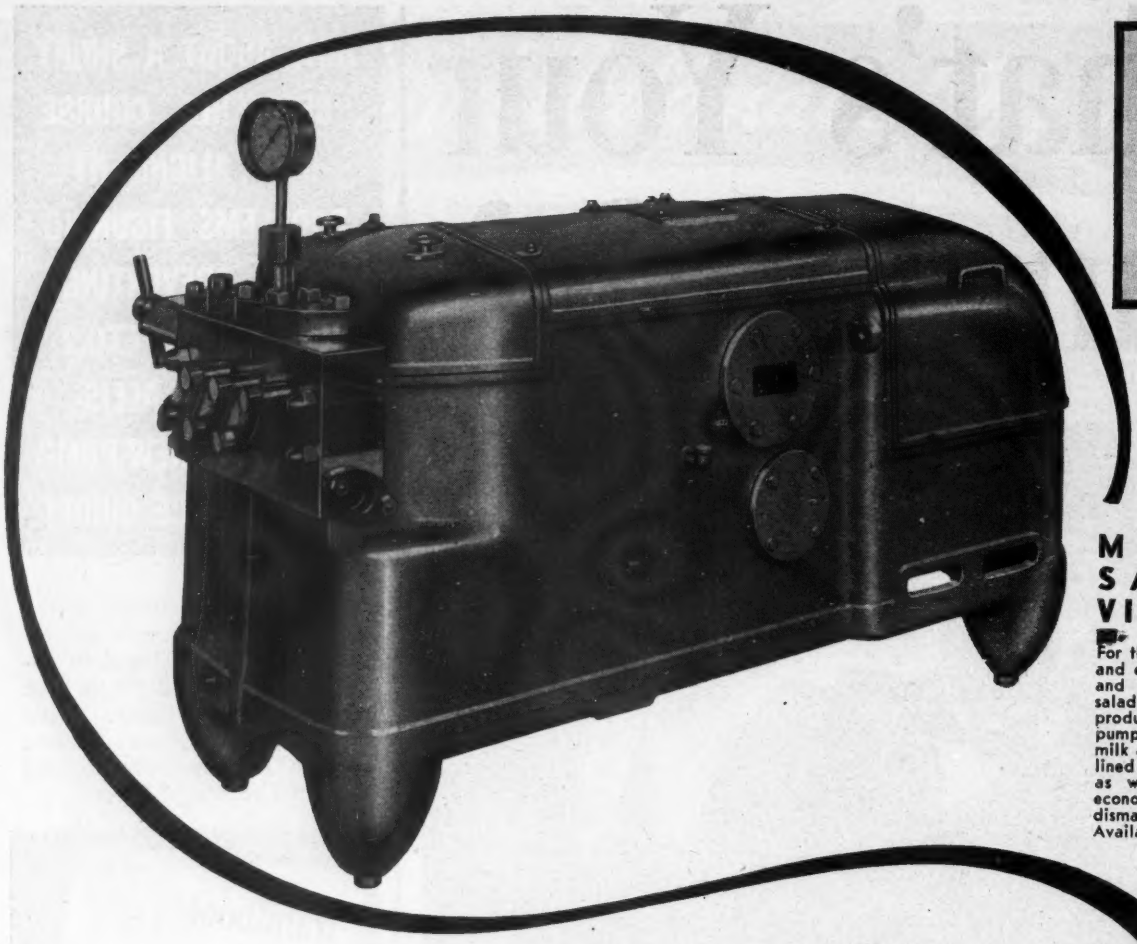
(Title)

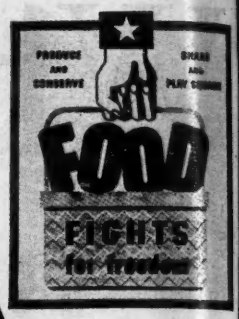
(Company)

(Street Address)

(City and State)

A 1655-G





MODEL 41 SANITARY VISCOLIZER

For the homogenization of milk and other dairy products, fruit and vegetable juices, soups, salad dressings and other food products. As a high pressure pump ahead of the dryer on milk and egg powder. Streamlined and completely sanitary as well as simple, durable, economical and efficient. Easily dismantled and reassembled. Available in various capacities.

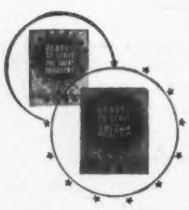
CHERRY-BURRELL
EQUIPMENT FOR SANITARY AND EFFICIENT PROCESSING OF MANY FOOD PRODUCTS

Cherry-Burrell Sanitary Food Processing Equipment serves many uses and covers a wide and varied range of products—baby food, extracts, eggs for egg powder, milk for dry milk, doughnut mix, soups, salad dressings, fruit and vegetable juices, candy coatings and fillings, emulsions, soft drinks, evaporated milk, vitamin bearing liquids and many others. It is sanitary equipment—absolutely sanitary. Its operation is distinguished for ease, simplicity, speed and economy. And it is durable and dependable.

Cherry-Burrell engineers have served the exacting needs of dairy products plants for more than 50 years. Cherry-Burrell equipment is designed to meet the most rigid sanitary codes in the food industry. We are interested in helping you solve your processing problems.

While war needs have reduced our production, a limited quantity of Cherry-Burrell quality equipment is available on proper priority ratings. See our 8-page insert in the Food Industries Catalog. Write for full information.

SANITARY VISCOLIZERS
•
FLEXFLO PUMPS
•
SANITARY PIPE AND FITTINGS
•
PASTEURIZERS
•
BATCH TANKS with Agitator for Heating, Cooling, Holding
•
BOXTUBE HEATERS
•
PLATE TYPE HEAT EXCHANGERS



CHERRY-BURRELL CORPORATION

427 WEST RANDOLPH STREET, CHICAGO 6, ILLINOIS

★ ★ ★

FACTORIES, WAREHOUSES, BRANCHES, OFFICES OR DISTRIBUTORS AT YOUR SERVICE IN 55 CITIES

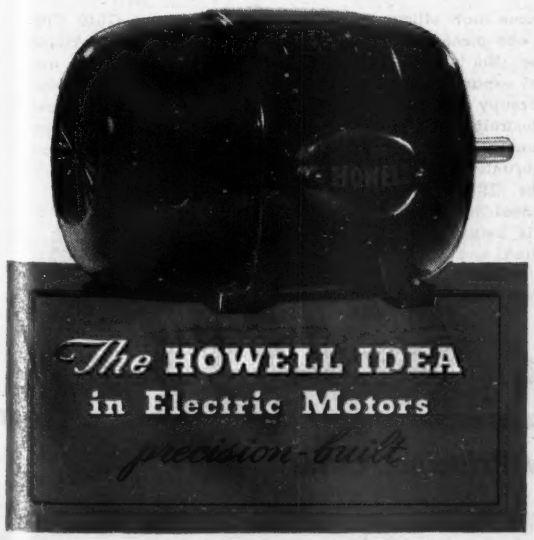
Looking to the future, Robert E. Bingman, noted Detroit industrial designer, gives you his conception of a Truck of Tomorrow. You can build these vehicles better, faster, using Howell Electric Motors in your plant — the motors that are built today for the precision standards of tomorrow.

For the plants that build tomorrow's trucks . .

Horsepower by Howell

Be ready for pleasant surprises in motor vehicles . . . After Victory, under our free enterprise system, private industry must take the lead in maintaining prosperity. Many of the new products that will add so much to our way of living will be built in factories with Horsepower by Howell. For Howell Motors are designed and precision-built to meet the exacting standards of manufacturers who want maximum production at minimum cost.

When making your postwar plans, specify Horsepower by Howell for your plant, process or products. Your inquiry will put our experienced engineering staff and complete facilities to work for you.

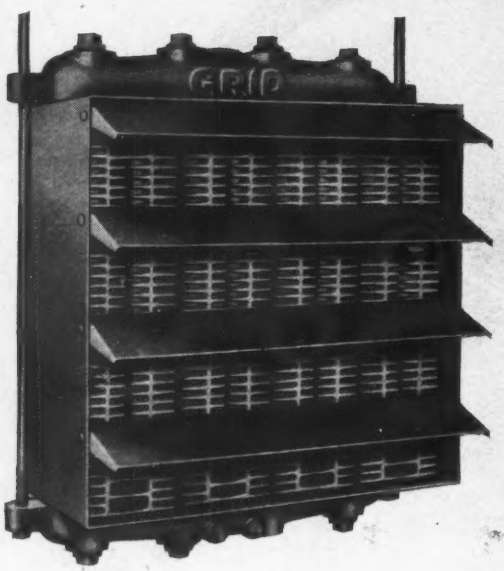


HOWELL ELECTRIC MOTORS COMPANY

HOWELL, MICHIGAN

Manufacturers of Quality Motors Since 1915

Install UNIT HEATERS and BLAST SECTIONS



that will stand wear as long as the pipes furnishing the steam or hot water to them

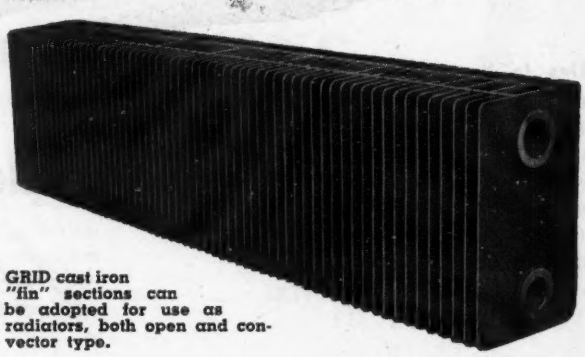
Cast Iron Series GRID unit Heaters are built to last, not just for the duration, but built to last for years—to last longer than other types of heating equipment. In many installations this means GRID Unit Heaters will last as long as the building itself. They will have the same high efficiency in years to come as the day they were installed.

No other unit heater has its lasting qualities. Cast Iron GRID Unit Heaters have the same physical properties as cast iron radiators—and you know how long they last. The "fin" heating sections are made of high test cast iron, to cooperate with the war effort (the standard GRID sections from 1929 to 1942 were made of high test cast iron steam chambers with cast aluminum "fins"). Engineered and tested to operate with either hot water or steam up to 250 lbs. pressure.

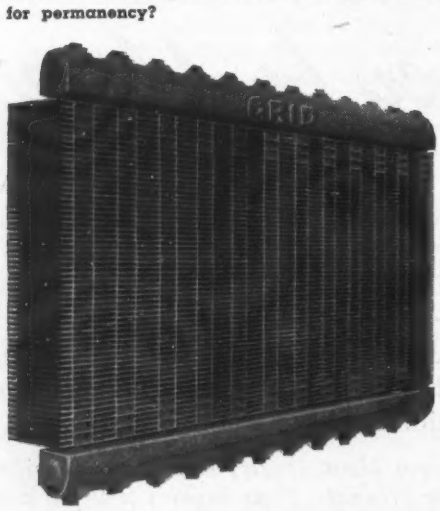
ONE PIECE CONSTRUCTION

NO SOLDERED, BRAZED, WELDED OR EXPANDED CONNECTIONS

GRID condenser "fin" sections are made in one piece. There's nothing to become loose—nothing to develop leaks or breakdowns—and being made of similar metals there's no electrolysis to cause corrosion, breakdowns or heating failures. So why install a unit heater that will lose its efficiency when used for a short period when you can get GRID for permanency?



GRID cast iron "fin" sections can be adopted for use as radiators, both open and convector type.



GRID Blast Sections have the same high efficiency and lasting qualities as GRID Unit Heaters. They are of the same one piece construction as the condenser "fin" sections and made of high test cast iron. No tortuous air passages, GRID Blast Sections are constructed to permit freedom of expansion with complete absence of ruptures, strains and warping. Compact, they occupy less space than other types of cast iron Blast Coils of equal capacity. No electrolysis can develop to cause corrosion. GRID open design makes possible easy cleaning. Nothing in the air, such as dust, fumes, lint, etc., can retard their operation. Guaranteed for steam pressures up to 250 lbs. GRID cast iron Blast Sections are ideal for installation where outside air is being brought into the room or building and strong enough to withstand freezing better than any other type of Blast Coils now being made for this use.

D. J. MURRAY MFG. CO., WAUSAU, WIS.

GRID

Offices in Principal Cities

As white and bright as ever!

JUST LIKE PAINTING A HOUSE. *Coated* Lithwite, with its surface mineral coating, gives you just the white you want.

Despite the shortage of critical wood pulps which necessitate the use of pulps of darker and poorer quality, you can still get folding cartons as white and bright as ever with *Coated* Lithwite

AS YOU KNOW, many high-grade paperboards *have* been affected by war conditions. But not *Coated* Lithwite. Its original whiteness and brightness, its brilliant printability, its unusual folding and sealing qualities have been maintained. And the reason: *the surface coating of this revolutionary paperboard is compounded of noncritical materials!*

All of this should be good news to carton buyers. For this genuine *mineral*-coated board enables you to give your packages the advantage of better appearance and—because there have been fewer problems in the production of *Coated* Lithwite than in some other high-grade paperboards—limited quantities of *Coated* Lithwite cartons are available from time to time.

Write. We will send you printed samples so you can compare the striking qualities of *Coated* Lithwite with your present cartons. Better still. Send along detailed specifications and a sample of your present carton and we will submit a quotation so you can also make a down-to-the-penny cost comparison with the cartons you are now using.

FINER PRINTING. *Coated* Lithwite's surface is so uniform and hard, so free from "chalkiness," that inks stand up brilliantly, halftones and type print crisply—without fill-up.

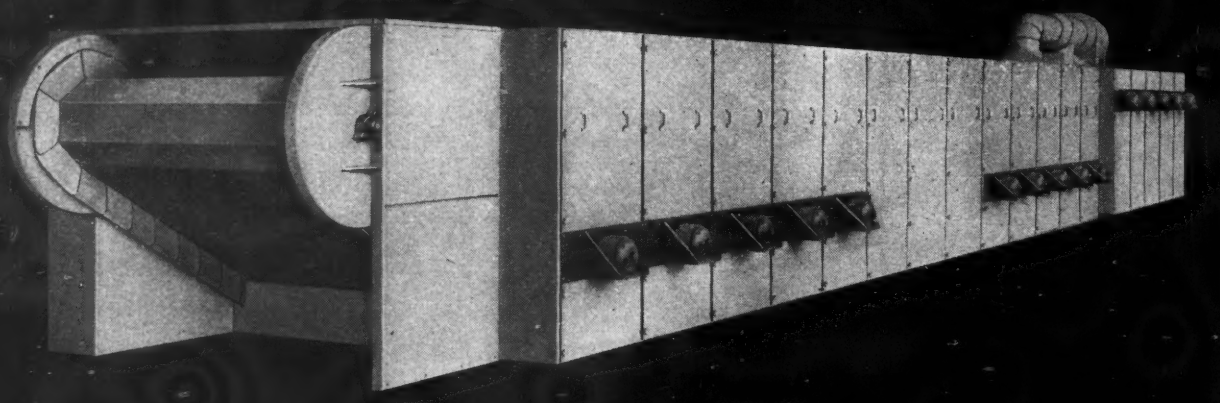
BETTER PERFORMANCE. *Coated* Lithwite bends, scores and folds without shattering. Takes a tight seal—and is not temperamental about the type of glue used.

The GARDNER-RICHARDSON Co.

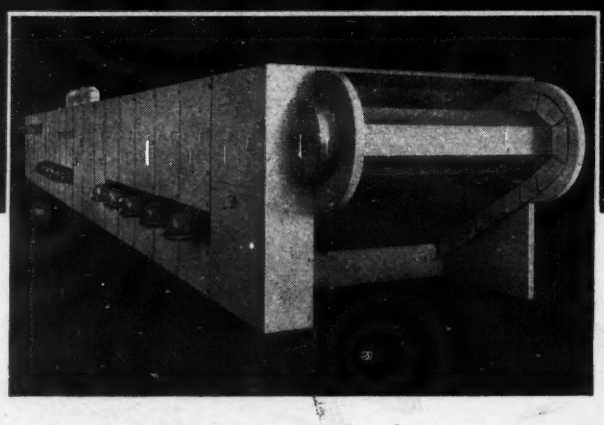
Manufacturers of Folding Cartons and Boxboard • MIDDLETOWN, OHIO

Sales Representatives in Principal Cities: PHILADELPHIA . CLEVELAND . CHICAGO . ST. LOUIS . NEW YORK . BOSTON . PITTSBURGH . DETROIT

The HUNTER continuous dehydrator



FOR AUTOMATIC,
UNIFORM PRODUCTION



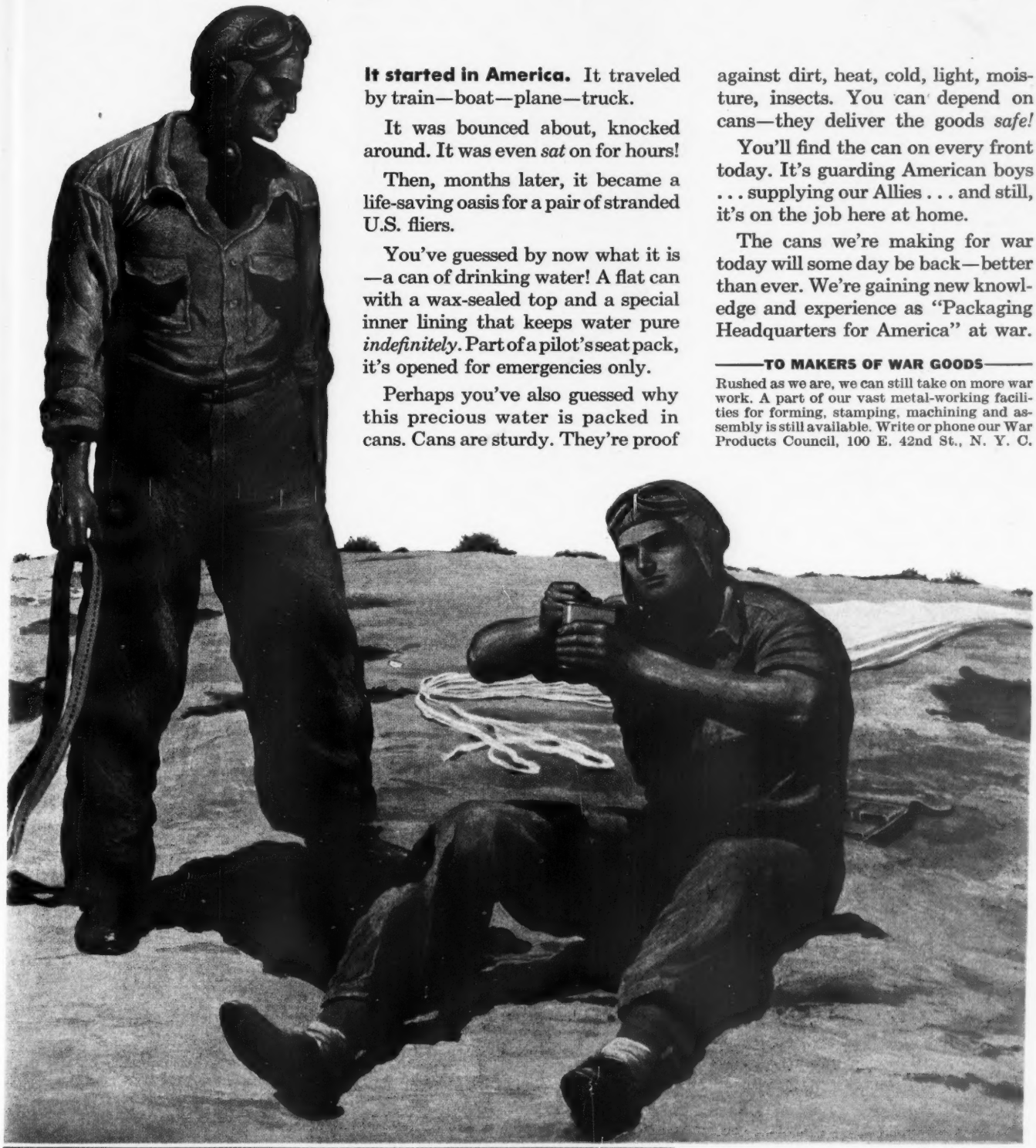
Illustrations show the new HUNTER Continuous Food Dehydrator. It comes completely equipped with all necessary controls for maintaining necessary temperatures and humidity. It is adaptable to continuously dehydrating a wide variety of food products.

The operation of this new, modern HUNTER unit is completely automatic from the time the blanched product is delivered to the feed end of the dryer until the completely dehydrated product is delivered to the proper containers.

For full details on this modern unit write to HUNTER ———

JAMES HUNTER MACHINE CO.
NORTH ADAMS, MASSACHUSETTS
FOUNDED 1847

The story of the traveling oasis



It started in America. It traveled by train—boat—plane—truck.

It was bounced about, knocked around. It was even *sat* on for hours!

Then, months later, it became a life-saving oasis for a pair of stranded U.S. fliers.

You've guessed by now what it is—a can of drinking water! A flat can with a wax-sealed top and a special inner lining that keeps water pure *indefinitely*. Part of a pilot's seat pack, it's opened for emergencies only.

Perhaps you've also guessed why this precious water is packed in cans. Cans are sturdy. They're proof against dirt, heat, cold, light, moisture, insects. You can depend on cans—they deliver the goods *safe!*

You'll find the can on every front today. It's guarding American boys . . . supplying our Allies . . . and still, it's on the job here at home.

The cans we're making for war today will some day be back—better than ever. We're gaining new knowledge and experience as "Packaging Headquarters for America" at war.

——TO MAKERS OF WAR GOODS——

Rushed as we are, we can still take on more war work. A part of our vast metal-working facilities for forming, stamping, machining and assembly is still available. Write or phone our War Products Council, 100 E. 42nd St., N. Y. C.

CONTINENTAL CAN COMPANY

HELP CAN THE AXIS
—BUY WAR BONDS

DUST RECOVERY SYSTEMS

Recognized throughout industry for their outstanding qualities and performance

The high efficiency of Buell (van Tongeren) Powder Collectors, installed in conjunction with spray dryers in the dehydration of many food products, virtually eliminates powder losses in the exhaust.

Buell Powder Collectors specially designed for food processing, are made of special metals to meet all Pure Food requirements. Rounded corners prevent lodgment of material, and hinged construction facilitates take-down for easy cleaning. Buell Powder Collectors have no moving parts, require little or no attention, and will not clog.

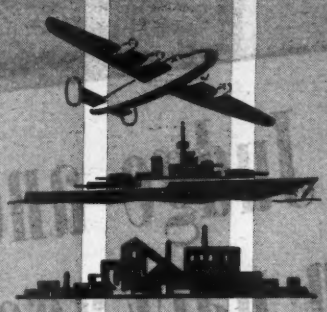
WRITE FOR BULLETIN G-842

BUELL ENGINEERING COMPANY, Inc.

SUITE 5000, 8 CEDAR STREET, NEW YORK 5, N. Y.

BUY WAR BONDS AND MAKE THE AXIS BITE THE DUST

A war Hero to Consider in Your Plans for the Future



In a bomber over Berlin . . .

aboard a battleship in the far Pacific . . .

on the production lines of American factories . . .

AT EVERY WAR FRONT ELECTRONICS IS PLAYING A HEROIC ROLE

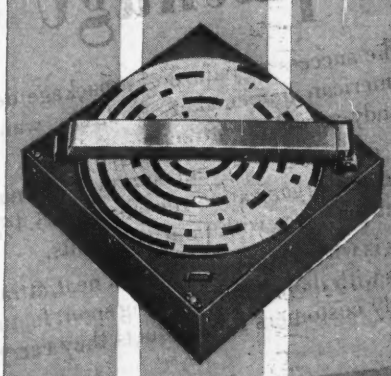
● There are hundreds of peacetime production jobs waiting for this war hero . . . jobs that Electronics can do better, faster, more economically.

In many ways which cannot now be told, General Electronics Industries has been helping to establish the great war record of Electronics through cooperative research with industrial organizations and Army and Navy research agencies. Our research engineers, skilled and experienced in advanced uses of Electronics, Hydraulics and Electromechanics, can give you valuable assistance in your production planning.

Remember: Today's plans mean tomorrow's profits. Write to Engineering Department, General Electronics Industries, 342 West Putnam Avenue, Greenwich, Conn.

●

ELECTRONIC CONTROLS • VACUUM TUBES • HYDRAULIC SERVOS COMMERCIAL RADIO EQUIPMENT • ELECTROMECHANICAL DEVICES • ELECTROSTATIC HEATING UNITS UP TO 250 KW.



AUTOMATIC PROCESS CONTROL

For control of industrial processes from printed charts. Provides automatic control of chemical processes, also of production machinery.

Other products manufactured include:

ARMY-NAVY "E" WITH STAR awarded to Auto-Ordnance Corporation for continued excellence in production of "Tommy" Guns.

GENERAL Electronics INDUSTRIES

Division of Auto-Ordnance Corporation

GREENWICH • STAMFORD • BRIDGEPORT • NEW MILFORD • NEW YORK

Judge and Jury on package design

The success or failure of a package design is up to the American homemaker. And, she wants her packages handy as well as attractive.

As evidence, a recent survey by a nationally known research organization reveals that 85.4% of the women want packages with pouring spouts.

This is why retailers report that neat, attractive Deltaseal Bags with their handy pouring spout feature make many steady customers for products they carry.

BEMIS BRO. BAG CO.

Headquarters for the

DELTASEAL System of PACKAGING

Minneapolis, Minnesota

OFFICES: Baltimore • Boston • Brooklyn • Buffalo Charlotte • Chicago • Denver • Detroit • E. Pepperell Houston • Indianapolis • Kansas City • Los Angeles

Louisville • Memphis • New Orleans • New York City Norfolk • Oklahoma City • Omaha • Peoria • St. Louis Salina • Salt Lake City • San Francisco • Seattle • Wichita

A Good Place to Start in Your POST WAR PLANNING!

Install or Convert to STAINLESS EQUIPMENT

Costs less than you may think if you specify this Borg-Warner Product

One of the first considerations in planning new construction or rehabilitating present plants and equipment should be to provide protection against corrosion. One of the most economical and satisfactory ways of doing this is to use IngAclad Stainless-Clad Steel...the Borg-Warner Product with a record of more than 10 years of satisfactory service.

Sharply Reduces Material Cost yet Gives Perfect Protection on the side that is used

As producers of both Ingersoll Solid Stainless Steels and IngAclad Stainless-Clad Steels, our engineers are able to give you unbiased recommendations, based on practical experience in serving America's leaders in the Chemical, Food, Paper, Soap, Textile and other Process Fields.

Prepare now for the competitive days ahead by improvement of product, lowering of production and maintenance costs through the use of non-corrosive equipment. It will pay you to investigate IngAclad NOW!

Users of IngAclad include these and many others:

American Cyanamid Co.
Armour & Co.
Corn Products Refining Co.
Dow Chemical Co.
Fleischmann Co.
General Foods Corp.
Hercules Powder Co.
Andrew Jergens Co.
Eli Lilly & Co.
Monsanto Chemical Co.
Northwest Paper Co.
Procter & Gamble Co.
Sherwin-Williams Co.
Standard Brands Inc.
United States Potash Co.

INGERSOLL STEEL & DISC DIVISION
BORG-WARNER CORPORATION
310 South Michigan Avenue • Chicago, Illinois
Plants: New Castle, Indiana; Chicago, Illinois; Kalamazoo, Michigan

"Back the Attack with WAR BONDS"

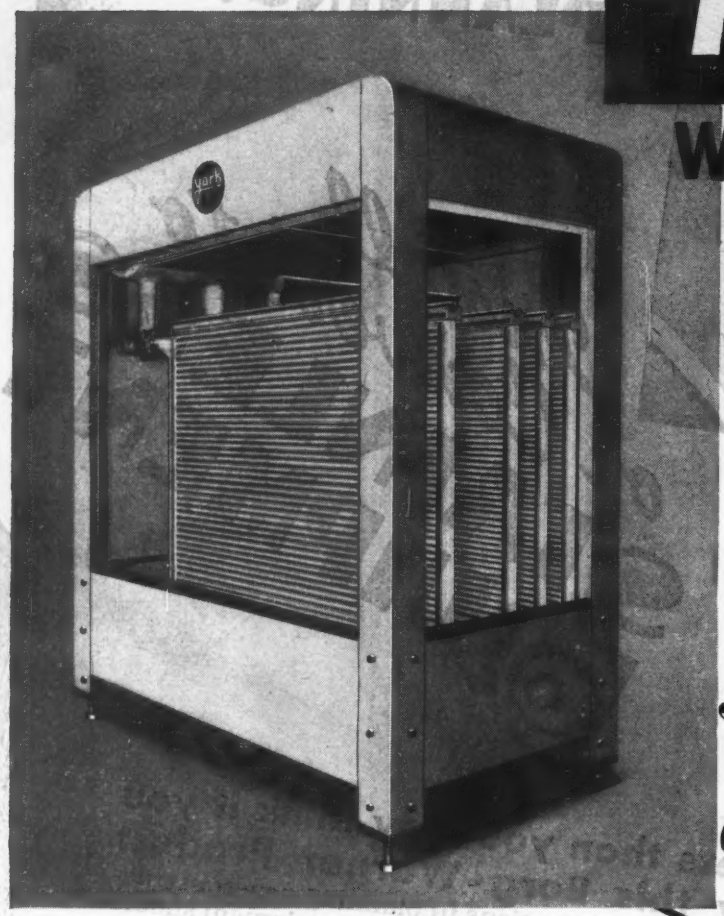
INGACLAD

STAINLESS-CLAD STEEL

"A Borg-Warner Product"

HERE ARE THE HIGHLIGHTS OF THE

"HIGH-K" WATER COOLER



1. No freeze-up danger.
2. Stainless steel plates for long life.
3. York Float Control for automatic operation.
4. Accessible for cleaning, easy to clean.
5. Insulated bottom pan holds low temperature.
6. *Available* for prompt delivery under priority clearance.

In this compact, packaged unit, unique efficiency is secured by distributing an even, unbroken film of water to each side of each stainless steel plate. Wide spacing of plates and smooth rippled form make cleaning a quick, easy job.

"High-K" coolers are specially suitable for refrigerated water cooling in dairies and milk processing plants and are available in a wide range of capacities, in models employing from one to six plates. For complete information look for the York trade-mark in the classified section of your telephone book and call the York distributor nearest you. York Corporation, York Pennsylvania.

YORK REFRIGERATION AND AIR CONDITIONING FOR WAR

HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

PERSPECTIVE

is the strangest thing

Take one of your packages, for instance. To you, it's mighty important. But as it gets farther away from home base, in the hands of wholesaler, retailer or customer, that importance diminishes. To them, it's just another item to be bought or sold.

Dobeckmun Packaging Engineers like to use the customer's perspective when they're designing packages. If your package can signal "come and get me" and then deliver your product in perfect condition, that's the one for you.

We've proved to a lot of people that our converted cellophanes, laminated films and foils deliver both eye appeal and product protection. While we're doing our share of War work right now, our engineers have time available for planning future packages with customer perspective. We'd like to work with you.

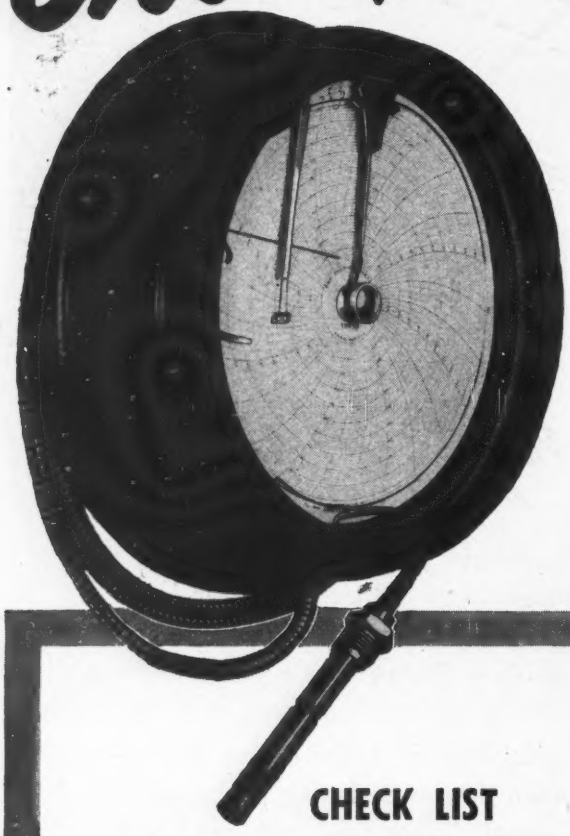
YOUR BATTLE STATION

Every time you eat a meal, you're at a battle station, fighting to save food to feed our fighting men. Remember, the Army fights on its stomach, so let's make sure to furnish them with all the food they need, by conserving our home supply. That way, you'll help food fight for freedom.

THE DOBECKMUN COMPANY

CLEVELAND, OHIO · OAKLAND, CAL.

Check These Chances



to improve your production through temperature records!

CHECK LIST

A few major temperature points where records from Foxboro Temperature Recorders often reveal opportunities for important production improvements:

COFFEE ROASTERS	OVENS
CANDY KETTLES	RETORTS
SCALDING TANKS	COOLERS
STORAGE ROOMS	COOKERS
SMOKEHOUSES	VACUUM PANS

A STAR IS ADDED . .

For continued outstanding production, The Foxboro Company has won renewal of the Army-Navy "E" Award.

Is it worth a few minutes of your time to stop important losses in your output, wastes of fuel, or spoilage of materials? All you need to do is review the critical temperature points in your equipment, and make sure you're getting daily records that "show up" such production losses!

No matter what step in your operation demands uniform temperature, Foxboro Temperature Recorders will automatically give you exact information to save quality-variations, spoilage and re-runs. Their ultra-sensitive thermal system reacts instantly to slightest temperature deviations. Their light, strong mechanism "writes it down" *accurately* for years, without attention except routine chart changes.

The Foxboro Temperature Recorder is one instrument you can always depend on. Precision-engineered for accuracy, endurance and trouble-freedom, it gives the facts at minimum cost per year! Write for full details in Bulletin 198-2. The Foxboro Company, 30 Neponset Avenue, Foxboro, Massachusetts, U. S. A.

FOXBORO

REG. U. S. PAT. OFF.

TEMPERATURE RECORDERS

STALWART, WAR-TIME POWER

American-made motors and generators have met the two and three shift requirements of war industry, with an astounding record of trouble-free performance.

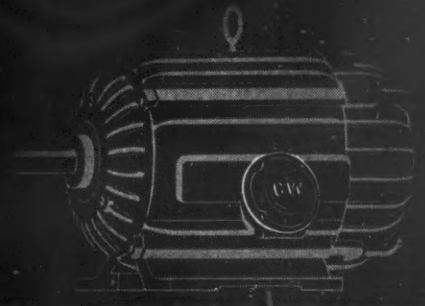
A sizeable proportion of these bear the Crocker-Wheeler name . . . quite a few of them are *older* than the operators of the machines they serve. For Crocker-Wheeler motors and generators, for over 50 years, have been carefully and durably built.

CROCKER WHEELER ELECTRIC MANUFACTURING CO.
Ampere, N. J. • *Division of* JOSHUA HENDY IRON WORKS

For engineering and service information, call . . .

*Boston	(COM 6907)	*Detroit	(TR 2-5785)
*Buffalo	(CL 4985)	New York	(CO 7-6700)
*Chicago	(FRA 1616)	Philadelphia	(WAL 1444)
Cincinnati	(MA 1345)	Pittsburgh	(AT 9818)
*Cleveland	(MA 3255)	*San Francisco	(EX 5531)
Washington	(EX 1991)		

. . . or your local Crocker Wheeler dealer * *Local Stock*



Be SURE . . . with CROCKER WHEELER

Other JOSHUA HENDY IRON WORKS factories at Sunnyvale, Pomona, Torrance, and Long Beach, California, and St. Louis, Mo.

WE CAUGHT 'EM COLD!

• It was a hard-fought campaign, rounding up the fruits and vegetables for quick-freezing—and learning how to keep them under control from freezer to kitchen.

• What with moisture-vapor loss, low temperatures, shipping and display problems—Container Corporation's frozen-foods people have fought packaging battles from the very start of the quick-freezing industry. But a large number of the successful packages have come from them.

• This broad experience has taught us one cardinal rule: there is *one correct package* for each frozen food. Our staff knows how to find that one—would you like to talk it over with them?

CONTAINER CORPORATION OF AMERICA

Chicago • New York • Rochester • Natick, Mass. • Philadelphia • Akron • Cincinnati
Cleveland • Circleville • Detroit • Indianapolis • Wabash • Carthage • Anderson, Ind. • Peoria
Rock Island • Minneapolis • Baltimore • St. Louis • Fernandina • Dallas • Ft. Worth

EVERYTHING PAPERBOARD FOR EVERYTHING PACKED

FOLDING CARTONS • BOXBOARDS • CORRUGATED AND SOLID-FIBRE SHIPPING CASES

Prevent Valve Failure *before it starts!*

SEDIMENT SMOTHERS WORKING PARTS...

speeds destructive wear in "Upside Down Valves"

Valves have no "upside-down stomach" to digest and dispose of destructive sediment. Because most valves are designed for upright installation, the inverted position invites a wide variety of troubles – sticking, incomplete closure, rapid wear, leakage, and eventual failure.

To make sure of efficient and trouble-free operation, plan upright installation for every service, and turn up valves in present use wherever possible. Second best to an upright position is a slightly tilted position. When it is absolutely necessary to invert a valve, be sure it is the type best suited for such conditions, and make sure it gets frequent attention. In the case of larger valves, provide a drain or suitable clean-out for blow-off purposes.

Production delays due to valve failure retard the delivery of vital supplies needed to "back the attack." Many such failures can be prevented ... by proper installation of valves, after careful selection of the proper type for the service ... by regular, systematic inspection ... by repair or replacement of worn parts ... by thorough instruction of maintenance workers.

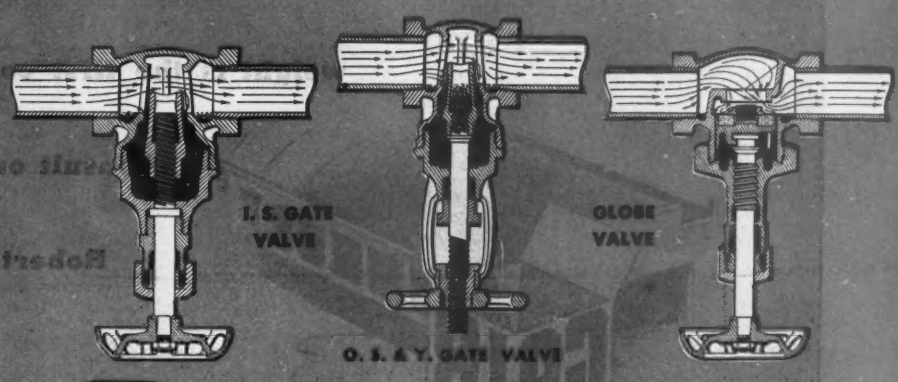
Consult Jenkins Engineers for any assistance you need in promoting valve conservation.

Jenkins Bros., 80 White Street, New York 13, N. Y.; Bridgeport; Atlanta; Boston; Philadelphia; Chicago. Jenkins Bros., Ltd., Montreal; London.

WHY INVERTED INSTALLATION STARTS VALVE "HEADACHES"

The destructive results of upside-down installation are illustrated in these sketches for three different types of valves. Similar troubles develop in other types when inverted.

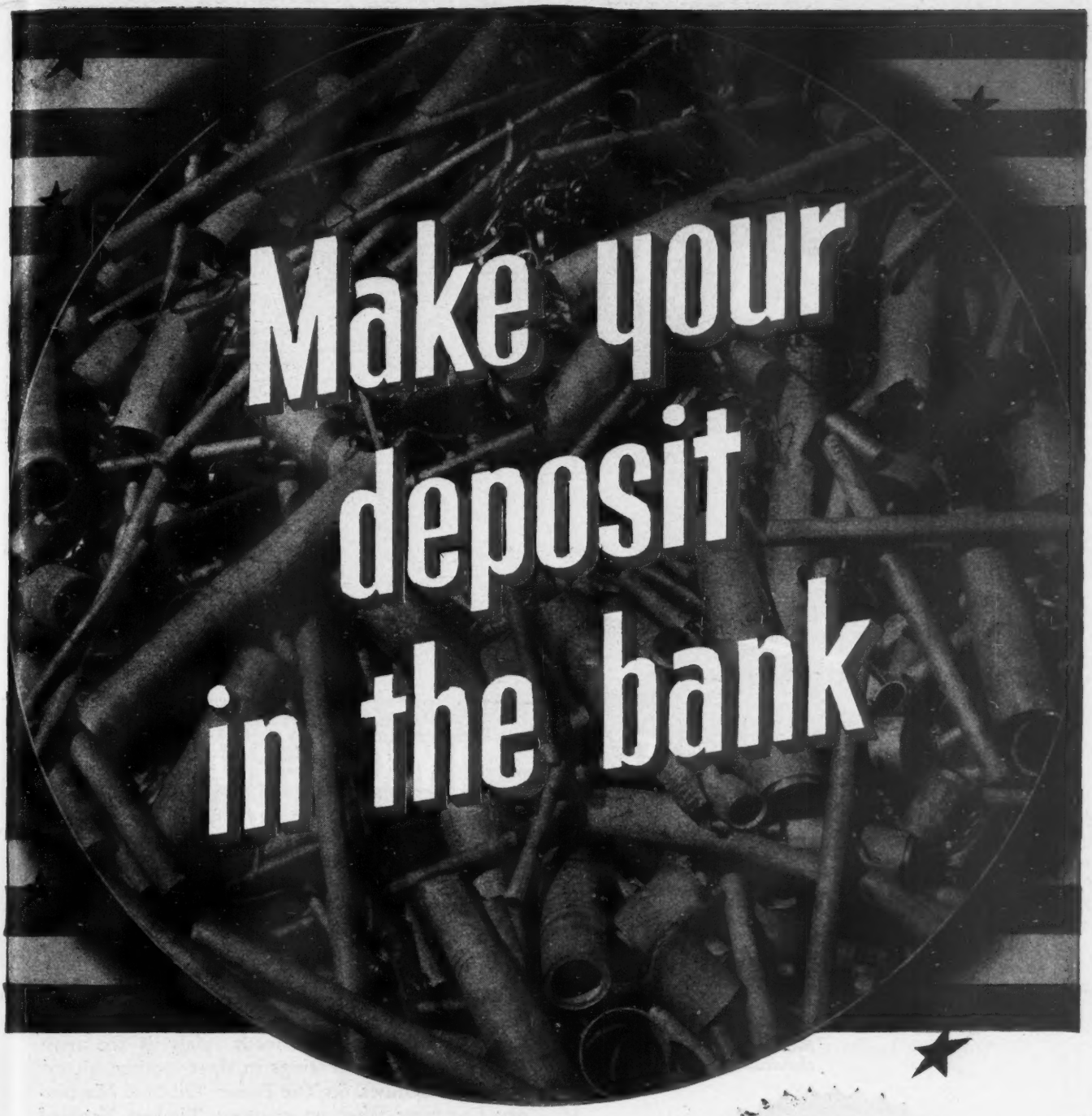
1. When closing valve, sediment may stick to wedge faces, prevent tight closing, and cause progressive damage to seat.
2. Sediment accumulation prevents complete back seating necessary when repacking under pressure. Line must then be closed while repacking.
3. Sediment accumulates in threads on spindle and wedge, causes sticking and rapid wear of threads.
4. Bonnet becomes a sediment collecting chamber.
5. Sediment and liquid, seeping down between body and spindle, causes scoring and rapid wear of spindle.
6. Seepage through packing box of O. S. & Y. valve affects operating threads on spindle, causing seizure and destructive wear.
7. Foreign matter lodging on disc face of a globe valve prevents tight closing and accelerates disc wear.
8. Packing deteriorates rapidly and leakage affects spindle and handwheel.



JENKINS VALVES

For every industrial, engineering, marine and power plant service ... in Bronze, Iron, Cast Steel and Corrosion-Resisting Alloys ... 125 to 600 lbs. pressure.

Gair by Air
One million planes will be in active service by
1950, reports the Civil Aeronautics Adminis-
tainers have proven to be ideal
weight is the first consideration
. . Consult our engineers
Robert Gair Company, Inc.
New York—Toronto
Save Waste Paper
for War Production
GAIR
FOLDING CARTONS • BOXBOARDS • FIBRE & CORRUGATED SHIPPING CONTAINERS

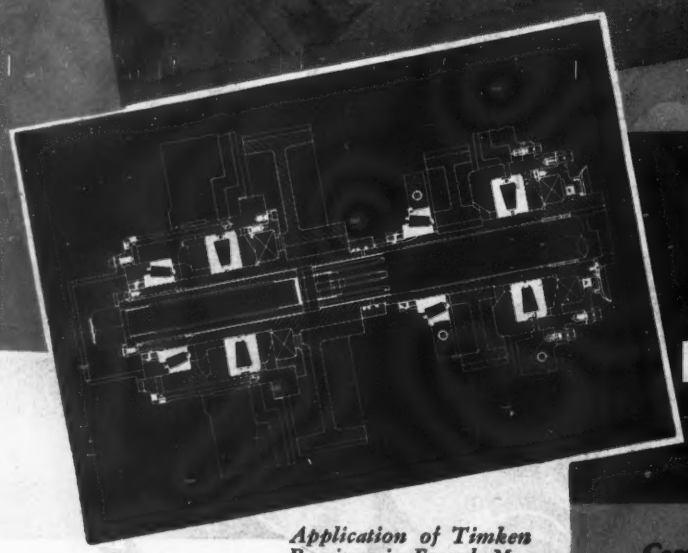


THE VICTORY SCRAP BANK DRIVE IS ON NOW

SCRAP piles have taken on a new significance these past few years. Far from being regarded as useless junk, they have become vital national resources. To produce the extra millions of tons of steel needed for war now and in 1944 will require a proportionate amount of scrap. At the outset of the war huge stockpiles were quickly collected from obvious junk scattered plentifully everywhere. Certainly it's more difficult to find this much needed scrap today, unless you are constantly searching for it. So make it a point to clean out your shop (and your home) regularly of all but the absolutely essential metal. Deposit this in the Victory Scrap Bank . . . a deposit that will pay you *real dividends.*

Allegheny Ludlum
STEEL CORPORATION
BRACKENRIDGE, PENNSYLVANIA

Battery of French Mechanical Screw Presses extracting oil from soya beans at Archer-Daniels-Midland Company, Decatur, Illinois.



Application of Timken Bearings in French Mechanical Screw Presses.

TIMKEN BEARINGS *Control Thrust in* FRENCH MECHANICAL SCREW PRESSES

Carrying terrific thrust loads safely is the most important job for bearings in these modern oil extraction machines. So The French Oil Mill Machinery Company takes no chances; Timken Tapered Roller Bearings are used to carry the thrust from the feed worm and main shaft worms.

Average thrust conditions in any kind of equipment can be handled along with the radial loads by Timken standard and steep angle bearings. In these mechanical screw presses, however, the thrust is so severe that Timken Type T Bearings, designed to carry nothing but thrust load must be used.

These bearings not only take thrust with a wide margin of safety, but take it without a sign of friction, thereby effecting large savings of power and lubricant; increasing endurance; and reducing maintenance. It pays to install Timken Type T Bearings where their use is indicated. The Timken Roller Bearing Company, Canton, Ohio.

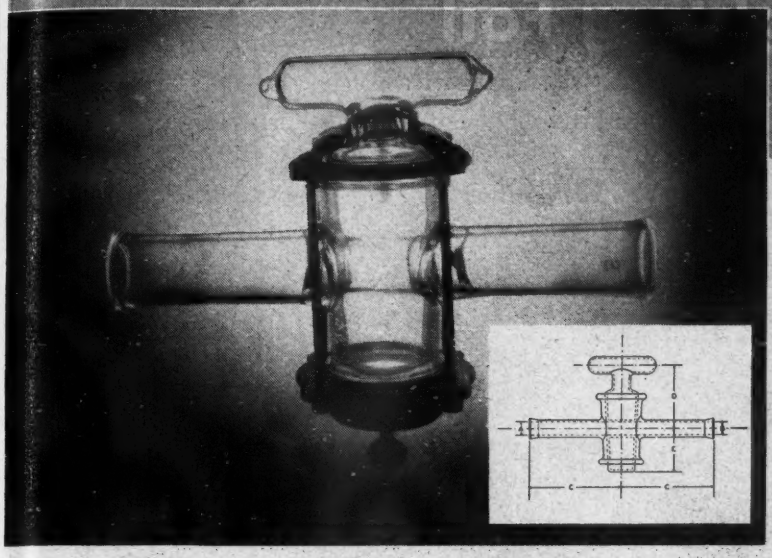
Head off post-war competition; redesign your machines to use more Timken Bearings.

TIMKEN

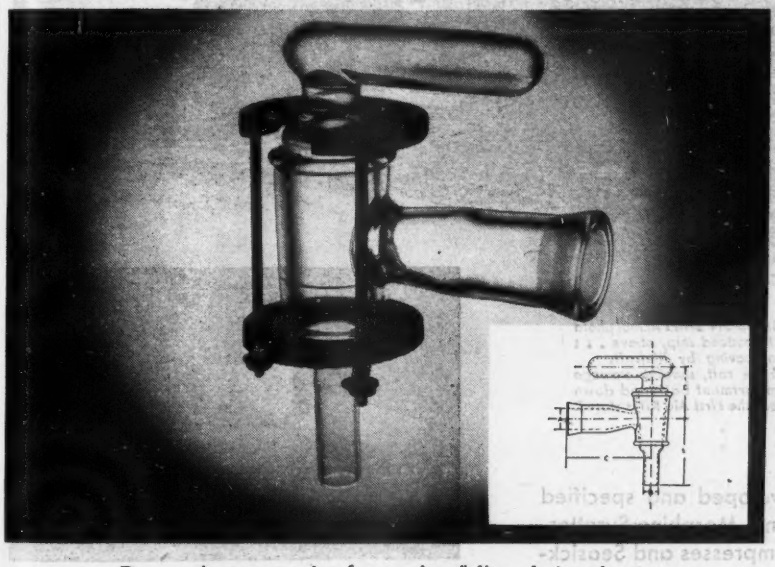
TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

How to use valves in Pyrex pipe lines



Pyrex plug type valve available in 1″ and 1½″ sizes. Used as standard flange, glass pipe fittings.



Pyrex spigot type valve for use in 1″ line, designed primarily for use as terminal outlets.

The use of PYREX Piping is in no way limited by inability to insert valves in the lines. PYREX brand Glass Valves are available in 1″ and 1½″ sizes. When valves are needed for the 2″, 3″, and 4″ lines, standard adaptor fittings are available to connect PYREX Piping directly to valves made of the following materials:

STEEL	PORCELAIN
CAST IRON	GLASS-LINED METAL
LEAD	HARD RUBBER
STAINLESS	RUBBER-LINED METAL

PYREX brand Glass Valves are ideally suited for use in 1″ and 1½″ lines. They are particularly qualified to handle dilute mineral acids, pharmaceutical preparations and distilled water. Like Pyrex Piping, they have the advantages of remarkable chemical stability, resistance to thermal shock, and transparency which reveals the contents at all times.

Consequently, you need not do without the advantages of PYREX Piping because valves present a problem. Corning engineers will gladly assist you in selecting the proper valve and installing them. Write to Industrial Division, Dept. FI2, Corning Glass Works, Corning, N. Y.

VALVE SPECIFICATIONS

SIZE	STYLE	NORMAL DIMENSIONS A	B	C	D	E
1″	Spigot	1″	23/32″	4⅛″	2 9/16″	3¼″
1″	Plug, Straight	1″	1″	7″	4¾″	3¼″
1½″	Plug, Straight	1½″	1½″	7″	4¾″	3¼″

Corning Glass Works, Industrial Division, Dept. FI2, Corning, New York

Gentlemen:

I would like glass piping information immediately on the subject I have checked below. I understand there is no obligation.

☐ Valves ☐ Installation Manual

☐ Pyrex Piping and Heat Exchangers ☐ Adaptors

Name.....

Firm.....

Street.....

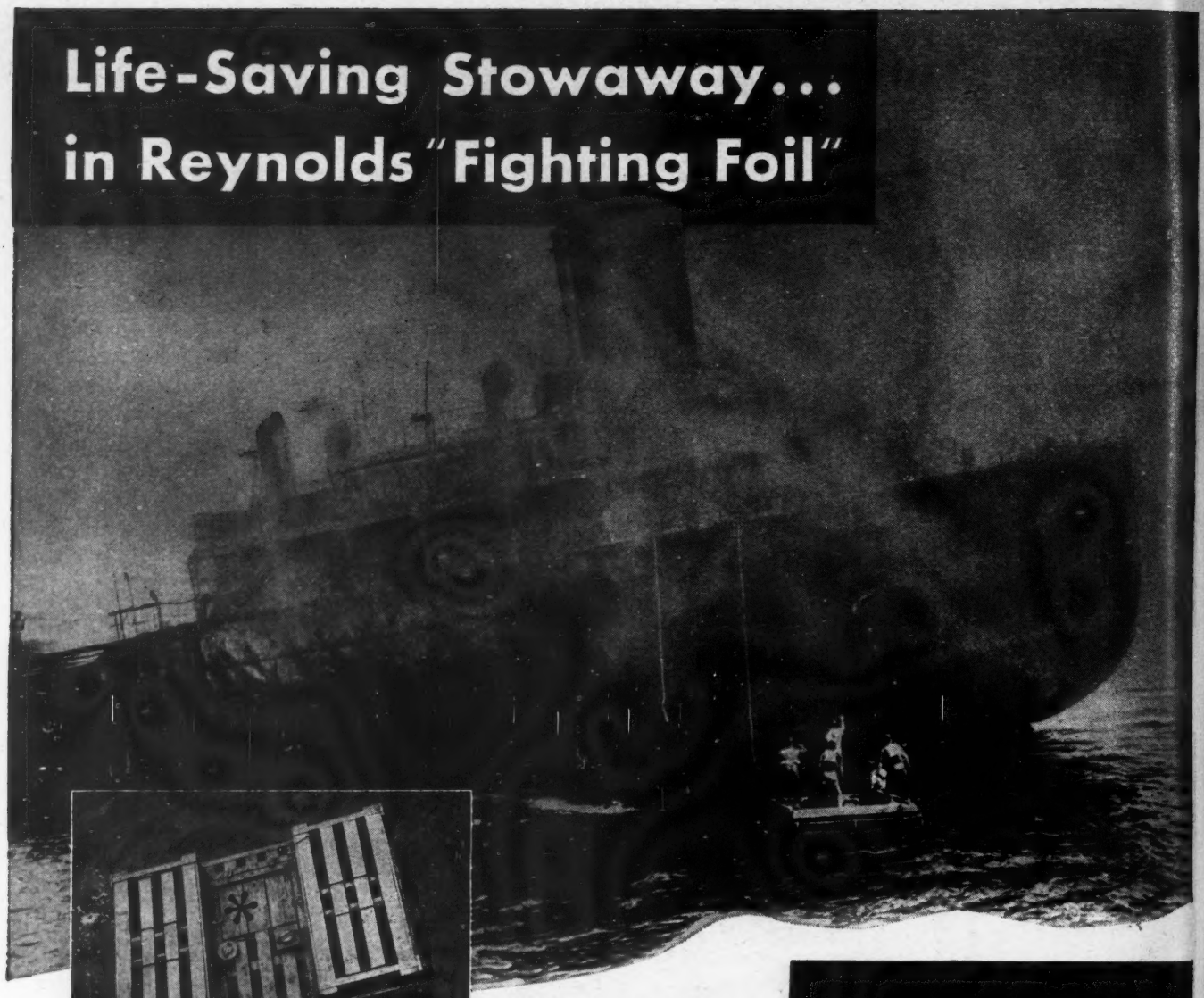
City and State.....

"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works, Corning, N. Y.

CORNING Glass Works Corning, New York

Pyrex Industrial Glass

Life-Saving Stowaway... in Reynolds "Fighting Foil"



ABANDON SHIP! *Actual photo of torpedoed ship, above 33 men leaving by life-raft.*
**The raft, showing stowage compartment battened down where the First Aid Kit is stored.*

THE FIRST AID KIT AND CONTENTS—*Convolute wound canister, metal top and bottom. Reynolds "battle-tested" packaging material, applied in the regular labeling operation, saves ⅔ of the critical material ordinarily used in all-metal containers—plus saving in shipping weight!*

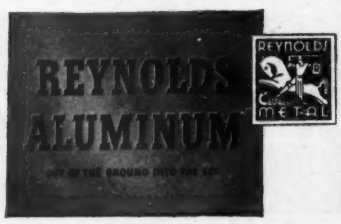
STOWED in U. S. Life Rafts, is the U. S. Navy-developed and specified First Aid Kit containing Sulfanilamide, Sulfadiazine, Morphine Syrettes, Iodine Applicator, Boric Acid Ointment, Bandage Compresses and Seasickness Preventives.

Here, where packaging can literally stand between a shipwrecked casualty and death, is additional proof of the superior protection of Reynolds "fighting foil." Reynolds uses solid sheets of metal foil, laminated to special processed materials and securely sealed, to make this "combat canister" waterproof. *It is positive protection against moisture-vapor transmission.*

Many forms of this new wartime packaging are now protecting drugs, foods, munitions and critical supplies on every fighting front. To its development Reynolds has brought not only the original skill of the world's largest foil producer . . . but the initiative that has made Reynolds "America's Great New Source of Aluminum."

Reynolds research and experience will also prove to be a great new source of product development and product-packaging for peacetime consumer markets. Sales representatives available throughout the U. S.

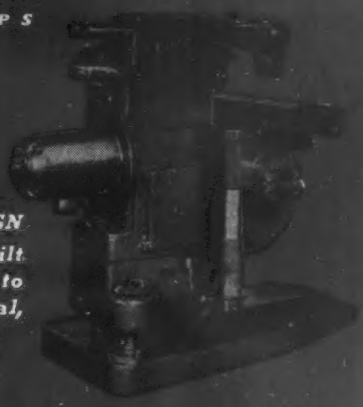
REYNOLDS METALS COMPANY • FOIL DIVISION
GENERAL OFFICES • RICHMOND, VIRGINIA



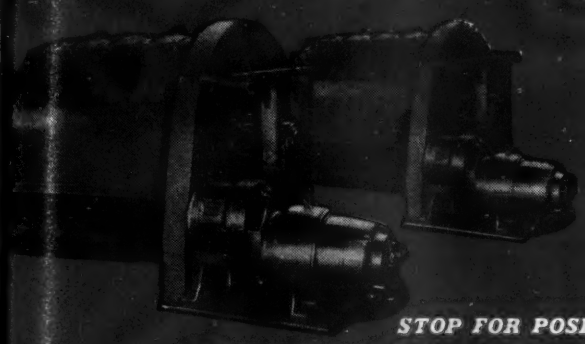
Reynolds Battle-Tested Material Meets These Army-Navy Requirements!

1. *Positive Protection Against Moisture-Vapor Transmission.*
2. *Immersion-Proof. Keeps Water Out!*
3. *Protection Against Insect Infestation, Odors and Light.*
4. *Substantial Saving in Tin, Steel and Other Strategic Materials.*
5. *Saving in Space, Especially Shipment and Storage of Empties.*
6. *Saving in Weight.*
7. *Serviceability Under Export Conditions.*

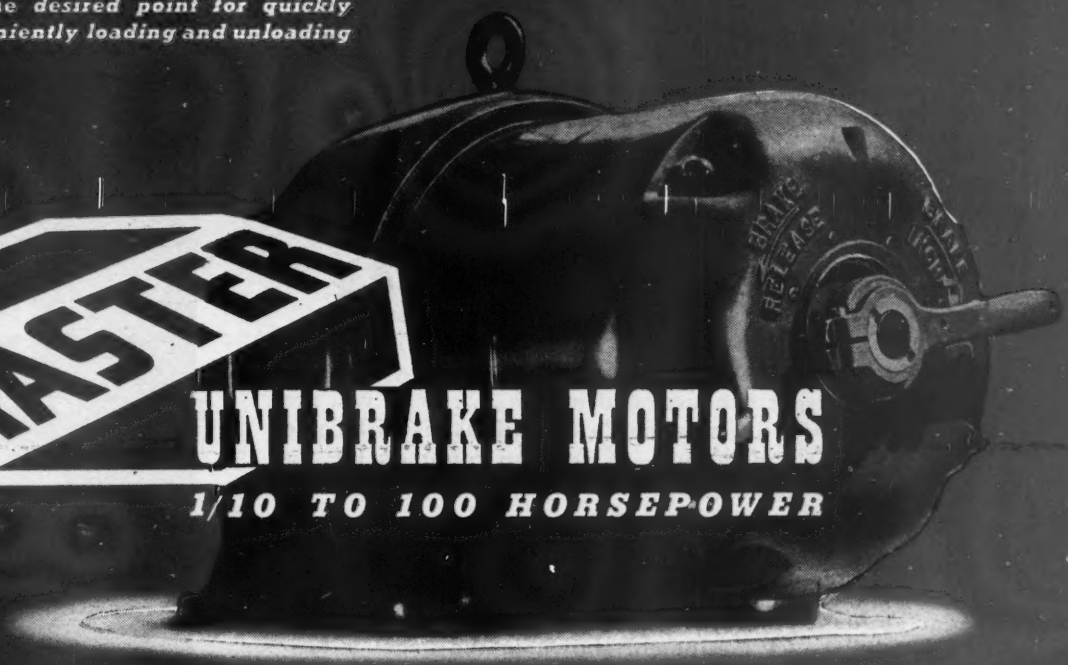
BUY UNITED STATES WAR BONDS AND STAMPS



SIMPLE COMPACT DESIGN
The electric brake is built into the motor end cover to form a compact, economical, easy to use unit.



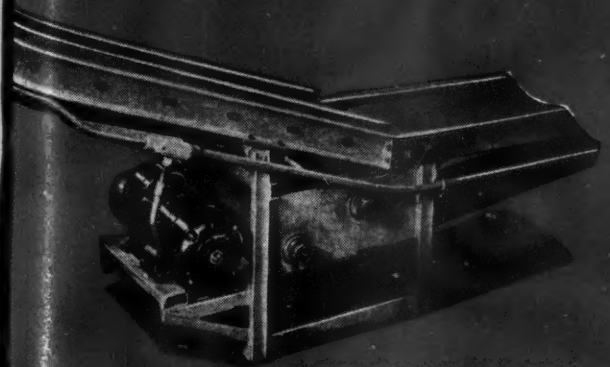
STOP FOR POSITION
Stop at the desired point for quickly and conveniently loading and unloading



MASTER UNIBRAKE MOTORS

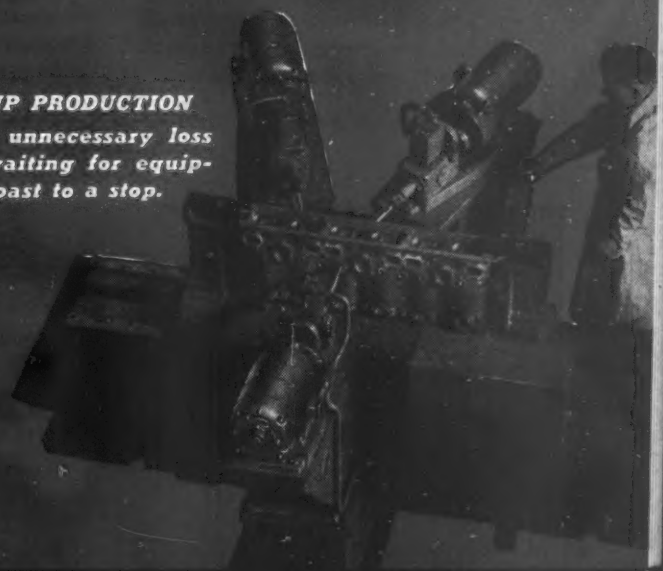
1/10 TO 100 HORSEPOWER

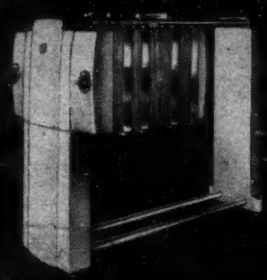
THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO



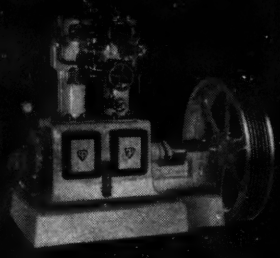
STOP AND HOLD ANY LOAD
Unibrake motors are very advantageous on hoists, elevators, inclined conveyors, etc....

SPEED UP PRODUCTION
Eliminate unnecessary loss of time waiting for equipment to coast to a stop.

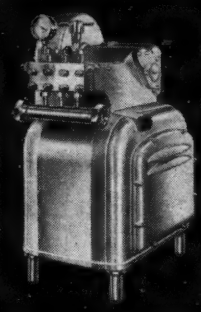




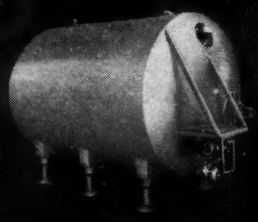
CP Full-Flo Plate Equipment



CP Vertical Ammonia Compressor



CP Multi-Flo Homogenizer



CP Cylinder Storage Tank

CP Film-Heat Multi-Process Tank

LET CP ENGINEERS HELP YOU PLAN TODAY . . . . . *for* 194V

Whether you face the problem of expanding your plant to meet present production demands . . . or if you are laying plans for anticipating the conditions that will come with post-war operations . . . you can count on CP for practical cooperation.

While our factories continue to produce war materiel, many CP craftsmen who formerly made precision parts for Army Tanks are now turning their skill to the production of vital dairy and food processing equipment. For example, the CP Equipment shown in the panel is now available on proper priority.

Continuously at your service are 18 CP Branch Offices, located in principal U. S. and Canadian cities. In each of them you will find a staff of sales and service engineers. And for special technical assistance, in solving today's problems . . . and laying plans for 194V . . . CP offers you the combined knowledge of a competent engineering staff, and a manufacturing organization with more than a half century of experience in the design and fabrication of dairy and food processing equipment and refrigerating machinery.

Write or phone the nearest CP Branch for full particulars.

Creamery Package

THE CREAMERY PACKAGE MFG. COMPANY, 1243 W. Washington Blvd., Chicago 7, Illinois
Branches: Atlanta — Boston — Buffalo — Chicago — Dallas — Denver — Kansas City
Los Angeles — Minneapolis — New York — Omaha — Philadelphia — Portland, Oregon
Salt Lake City — San Francisco — Seattle — Toledo — Waterloo, Ia.
CREAMERY PACKAGE MFG. CO. OF CANADA, LTD., 267 King St., West, Toronto 2, Ont., Canada
The Creamery Package Mfg. Company, Ltd., Avery House, Clerkenwell Green, London, E. C. 1, England

ARMY E NAVY
Creamery Package
Fort Atkinson
Plant

Modern way to lower costs

Wissco Flexible Metal Conveyor Belts have the stamina and the *in-built* toughness that insure maximum production at low costs, no matter what the operating conditions are . . . white heat or subzero, abrasion, corroding chemicals or other gruelling punishment.

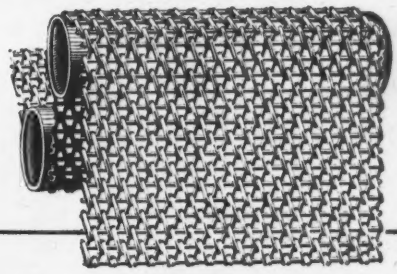
Each Wissco conveyor belt is custom-engineered and manufactured to meet the requirements of a specific job. Back of each belt are 45 years of experience in metal conveyor belt design . . . and a grand total of 122 years of accumulated skill in producing wire and wire products.

Write for the book "Wissco Metal Conveyor Belts". Wickwire Spencer Steel Company, 500 Fifth Avenue, New York 18,—or Buffalo, Chicago, Worcester, San Francisco.

Flexibility? Wissco Conveyor Belt construction permits operation over small diameter pulleys, insuring extreme flexibility and economy in design.

Where they are being used

Annealing Ovens
Hardening Furnaces
Brazing Furnaces
Degreasing
Dehydrating Food
Canning Operations
Chemical Processing
Decorating Glass, Ceramics
Reclaiming Tin, Rubber, etc.



★ WISSCO ★

CONVEYOR BELTS FOR EVERY PURPOSE

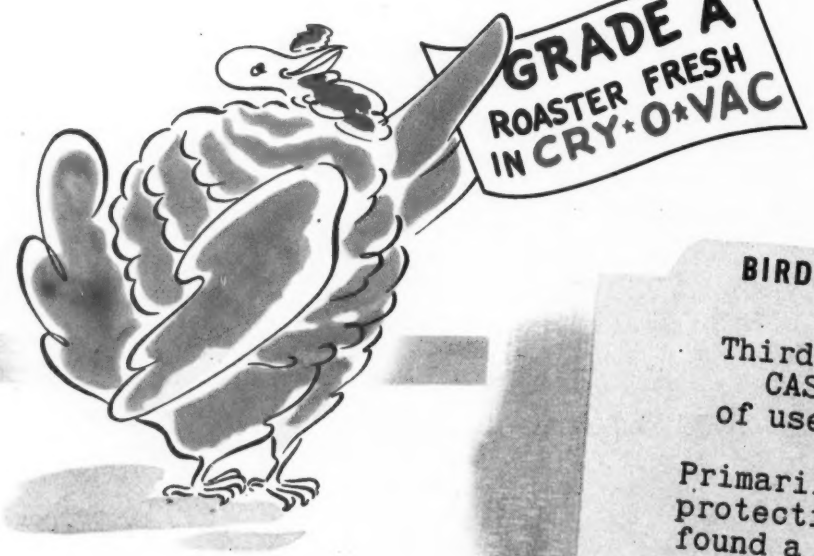
ONLY THE TOP HALF OF THE TOP GRADE IS ACCEPTABLE

Birds Eye have demonstrated the consumer response to quality products. Theirs is a story of selection and quality control from start to finish.

They use only the top half of Grade A birds. But this is only a beginning — for the same careful control continues throughout the processes of preparation and packaging. All food men realize the vital need for a truly protective wrapping to seal in flavor and moisture, but that is only one of the reasons Birds Eye chose CRY*O*VAC for their turkeys, ducks, and chickens.

A successful packaging material must not only protect — it must also lend itself to boom-time, mass production. Turkeys, for example, are at their best in one brief period close to the traditional turkey holiday, Thanksgiving. That's where the truly functional nature of CRY*O*VAC proved its utility for Birds Eye. It gave them a packaging method — with high output per operator—that could be vacuumized and heat-sealed in simple equipment. Being extremely tough at low temperatures and still stretchable, CRY*O*VAC did not tear or puncture from the squeezing action of their contact plate freezers. Most important of all, its imperviousness to moisture-vapor effectively sealed in flavor and prevented freezer burn and loss of weight.

Consumer-minded Birds Eye were quick to merchandise the advantages of their new protected packs. Their consumer jury — the buying public — quickly proved that people appreciate a packaging method which delivers top grade, "farm-fresh" poultry far from the farm, or long after the traditional seasons have passed.



BIRDS EYE

Third in a series of
CASE HISTORIES
of users of CRY*O*VAC

Primarily interested in protecting quality, they found a merchandising bonus.

*CRY*O*VAC
Reg. U. S. Pat. Off.
A product and a process for the protection of quick-frozen foods.

P.S. As soon as CRY★O★VAC is once more available, Birds Eye plan to use it again.

ARMY E NAVY

CRY★O★VAC* IS A PRODUCT OF

DEWEY AND ALMY CHEMICAL COMPANY

CAMBRIDGE 40, MASSACHUSETTS

You may be interested in receiving the complete series of case histories telling how CRY★O★VAC has already solved many packaging problems of the frozen and refrigerated foods industry—from eggs to poultry, from blueberries to veal. A letter to Dept. CV, Dewey and Almy Chemical Company, Cambridge 40, Mass., will insure your seeing them all.

THIS ADVERTISEMENT IS ADDRESSED TO FIVE CONCERNS EACH NEEDING $500,000–*TOMORROW!*

THIS is probably the most forthright advertisement ever published by a conservative financial House. And advisedly so.

The tempo of the day and the temper of industry's needs, under the lash of war, call for unvarnished words and shirt-sleeve facts.

Accordingly, we say that you can have our check for $500,000*... *more*, if you need more... less, if less is called for; on a basis that will *solve* rather than *involve* your problems. And you can have it in an incredibly short time—if there is a reasonable relationship between your worth and the amount of money required. And provided we can help you make money with reasonable safety to ourselves.

Whether you want to use this money to pay heavy taxes, purchase needed equipment, buy out a partner, handle more business with your present capital . . . or for any other vitally important purpose . . . you will be free to follow through with your plans without the need for repaying this money at the expense of your operation.

Under our plan of financing, current ratios are not the controlling factor. The cash you get from us, under ordinary conditions, will be at your disposal indefinitely. In effect, it serves as capital money.

Frankly, our charges are higher than bank rates. But figured on the basis of end-results, extremely reasonable.

You may communicate with us in strictest confidence regarding our ability to meet your specific needs. Write, phone or wire today.

*In 1942 our volume totaled $177,000,000

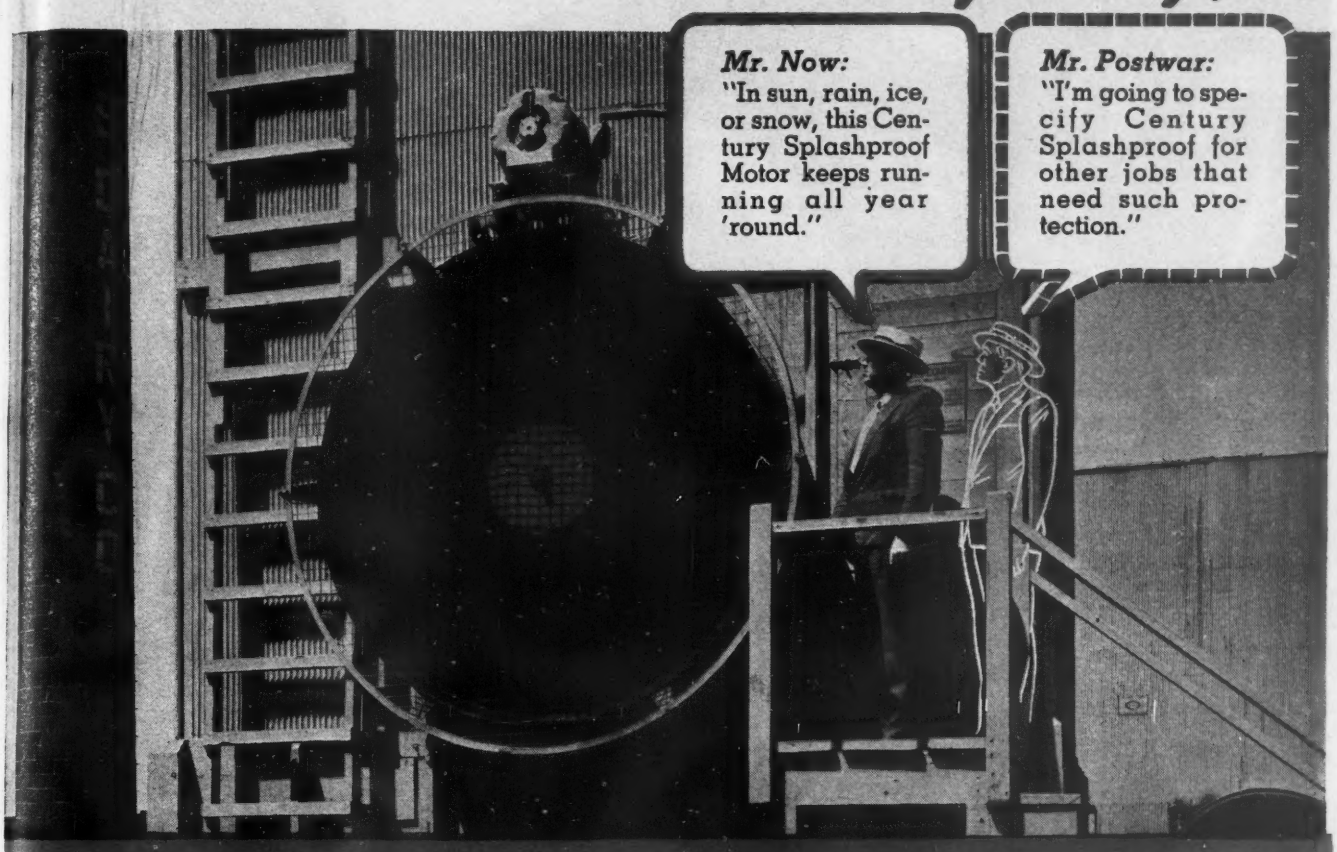
WALTER E. HELLER & COMPANY

FACTORS...Sales Financing—Installment Financing—Rediscounting

ESTABLISHED 1919

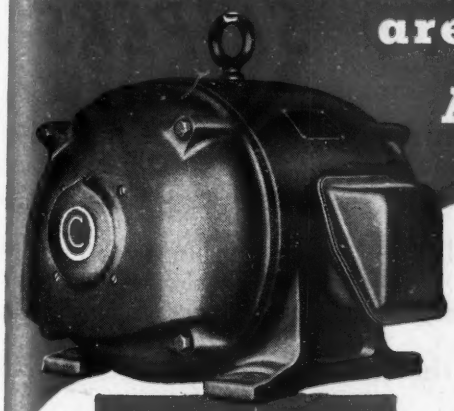
105 WEST ADAMS ST., CHICAGO • 60 EAST 42ND ST., NEW YORK

Take a Look at TOMORROW— *Today!*


Mr. Now:
"In sun, rain, ice, or snow, this Century Splashproof Motor keeps running all year 'round."
Mr. Postwar:
"I'm going to specify Century Splashproof for other jobs that need such protection."

CENTURY SPLASHPROOF MOTORS

are *"Weather Protected"* For All Outdoor Installations



For dependable, continuous service in outdoor applications, you can rely on Century Splashproof Motors for economical performance. They can be safely installed wherever they must be exposed to rain, snow, sleet, ice, or falling solids, and they'll stay on the job day after day.

Because this type of Century Motor is splashproof outside—moisture resistant inside, it's ideally designed for such outdoor installations as the cooling tower illustrated above.

In addition, Century Splashproof Motors are protected against splashing water, plant washdowns, or falling solids—conditions often found in food processing interior installations. These motors are also available with special insulations for applications where the air is charged with abnormal concentrations of acids, alkalies, or steam.

Century Splashproof Motors are only *one* of Century's wide variety of motor types, in sizes from fractional to 600 horsepower. Today—and tomorrow, it will pay you to consider Century whenever electric motor drives are required.

CENTURY ELECTRIC CO., 1806 Pine Street, St. Louis 3, Mo.
Offices and Stock Points in Principal Cities

One of the Largest EXCLUSIVE Motor and Generator Manufacturers in the World.

GUARD AGAINST THESE FOOD "SNIPERS"

America's food supply is constantly threatened by these lurking "enemies." Protective packaging of the highest order is vital in these days when food serves as our greatest weapon. The specialized protective papers for which Rhinelander has long been noted are serving Uncle Sam on many fronts both in safeguarding precious food supplies and protecting from the elements many items of ordnance materiel. All our "know how" and all our resources are dedicated to aiding in the important job of war-time packaging.

RHINELANDER
PROTECTIVE PACKAGING
Papers

FROM THE BEST THAT'S MADE TO THE CHEAPEST THAT'S GOOD

Genuine Greaseproof
Coffee Bag Papers
Confectionery Papers

Cereal Wrapping Papers
Laminated Greaseproof Papers
Lard and Shortening Liners

Bakery Product Wraps
Cracker Box Liners
Greaseproof Innerwraps

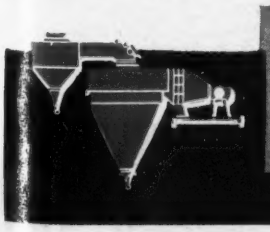
Wax Laminated Glassine
Opaque Label & Bag Glassine
Packing Industry Wrappings

RHINELANDER PAPER COMPANY • MILLS AT RHINELANDER, WISCONSIN, U.S.A.

START PLANNING *NOW*
FOR PEACETIME DRIED FOOD PROFITS

DRIED foods will become increasingly important in post-victory America . . . an America streamlined for highest efficiency. Needless waste, spoilage, weight, and bulk will have no place in it . . . not with a single transport plane already able to haul in one trip enough powdered soup to serve 2,000,000 people, as reliably stated. Just one angle of the many which can be translated into terms of dried milk, eggs, butter, and other dairy foods.

Prepare now for your proper place in the picture. Assure that place by equipping with the choice of many prominent, successful leaders in the field . . . Douthitt Gray-Jensen Spray Dryers. Write for details.



DOUTHITT GRAY-JENSEN

SWENSON EVAPORATOR CO. DIVISION of WHITING CORPORATION

221 No. La Salle St., Chicago 1, Ill., U. S. A.

WHY IS OURS THE BEST FED ARMY?

MUCH of the food for our fighting forces is processed under the protection of immaculate stainless steel cooking equipment—arrives at all fronts with its fresh color and flavor, its vitamins, minerals and nutritional value—intact.

Packers who are using U·S·S Stainless Steel cooking equipment can tell you that it maintains a new degree of cleanliness and purity. Non-toxic, it prevents metallic contamination, is impervious to the action of fruit and vegetable acids.

Easy to clean, long wearing, rust-resisting U·S·S Stainless Steel kettles, vats, evaporators, transfer lines and filling machines are saving priceless time for packers fortunate enough to have them.

The pressing demands of war production, tremendous volume plus rigid quality standards, make U·S·S Stainless Steel a "must" in every processing operation that brings food stuffs into contact with metal.

Much as you want to keep your plant completely up-to-date, thoroughly efficient, you may find it difficult—even impossible—to get new U·S·S Stainless Steel equipment at the moment. It will pay you well to plan ahead now, to investigate thoroughly, to be ready, when the time comes, to take full advantage of the unique combination of qualities you get with U·S·S Stainless Steel.

ONE AIM . . . VICTORY . . . *BUY BONDS*

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

U·S·S STAINLESS STEEL

"Be glad it's Stainless . . . it lasts longer!"

Sheets · Strip · Plates · Bars · Billets · Pipe · Tubes · Wire · Special Sections

UNITED STATES STEEL

YOUR POSTWAR PACKAGE

The Time to Start Planning it is NOW!

If the war should end tomorrow what you will have to offer the postwar world will be precisely what you have ready today. Recognizing this . . . many forward-thinking concerns are already planning their postwar packages . . . working out now, details for which there may well not be time later. Why not consult a Milprint representative today? There is no obligation.

Printed Cellophane, Pliofilm, Glassine, Aluminum Foil, Coated and Laminated Papers in all forms including Sheet Wraps, Rolls, Pouches or Specialty Bags.

Revelation Bread Wraps, Specialty Folding and Window Cartons, Counter Displays, Simplex Pie and Cake Units.

Lithographed Advertising Displays, Specialized Letterpress and Rotogravure Printing of All Kinds.

MILPRINT Inc.

PACKAGING CONVERTERS • PRINTERS • LITHOGRAPHERS

PLANTS AT MILWAUKEE • PHILADELPHIA • LOS ANGELES

SALES OFFICES IN . . . SAN FRANCISCO • CHICAGO
NEW YORK • MILWAUKEE • PHILADELPHIA • LOS ANGELES • BOSTON
ATLANTA • MINNEAPOLIS • ST. LOUIS • CLEVELAND • CINCINNATI

Equipment such as heat exchangers, pipe lines and heating coils stays on the job longer when made from this Stainless Tubing.

For positive protection against specific corrosive elements, and oxidation from high temperatures, it will pay you to learn more about this tubing.

In many plants, processes are completed faster because Carpenter Welded Stainless Tubing helps to reduce maintenance time. And because the inside surfaces are smooth, no tiny particles can lodge and give corrosion or product contamination a foothold. And this tubing is easy to clean, easy to keep clean.

For help with your special problems where corrosion and heat present processing difficulties, consider Carpenter as your general headquarters for useful information about Stainless Tubing. Much of our pioneering work and years of experience can probably be put to good use in solving your problems. Drop us a line today.

HERE'S WHY THIS STAINLESS TUBING IS EASY TO FABRICATE . . .

Uniform walls throughout mean that lighter gauges can be used without sacrificing strength. And *lighter gauges* permit savings in weight, as well as lower costs.

USE THIS PRINTED HELP TO GET THE MOST FROM THE STAINLESS TUBING YOU USE!

This convenient file folder provides some of the basic information you need when considering the use of Stainless Tubing. It gives data on corrosion resistance, physical properties of Carpenter Welded Stainless Tubing, sizes and shapes available, etc. A note on your company letterhead will start your copy on its way, so let us hear from you today.

THE CARPENTER STEEL COMPANY
Welded Alloy Tube Division • Kenilworth, N. J.

Carpenter
WELDED
STAINLESS TUBING

An ocean apart . . .

but they've rubbed elbows with the same GREER HOIST

TWO MONTHS after Pearl Harbor, Greer had performed one of the many minor miracles that this War has produced. They went from 30% "defense work" to 100% war production.

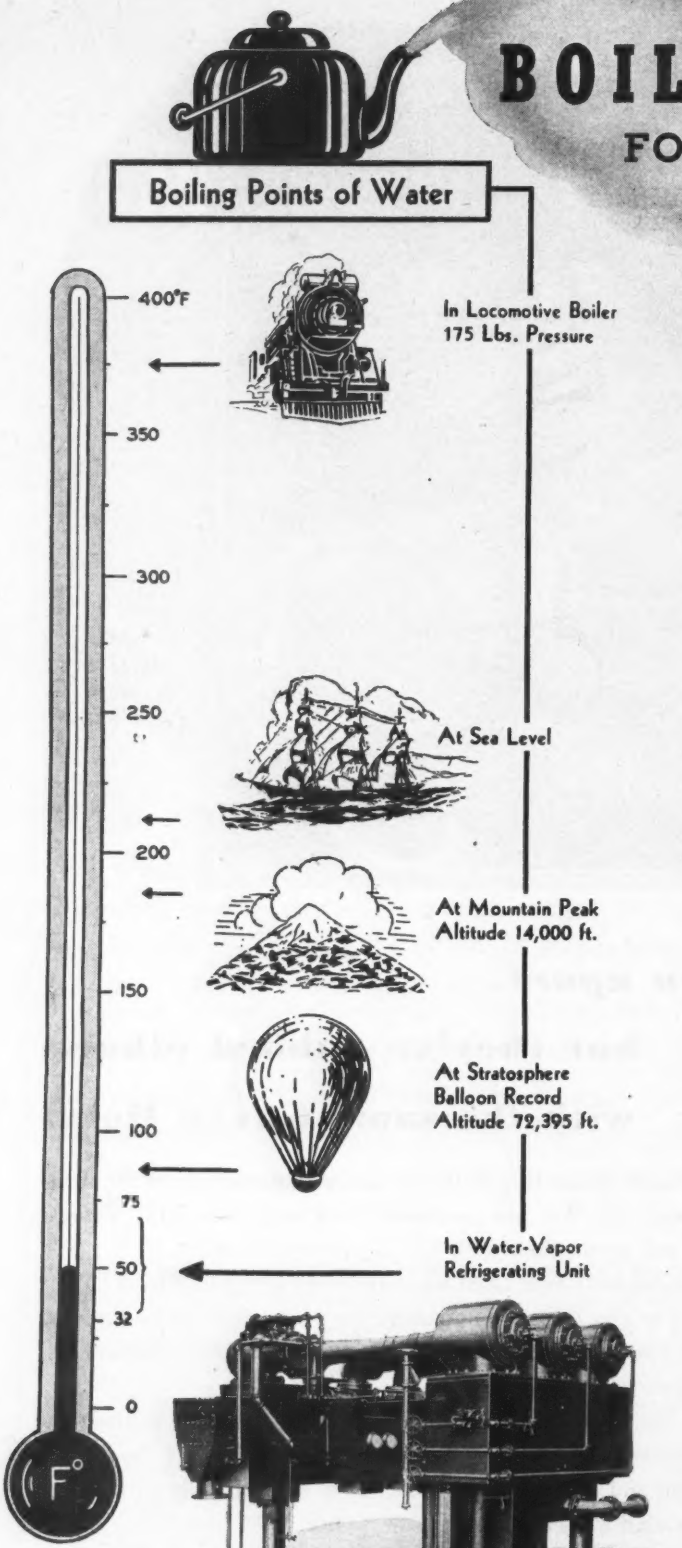
Many a man from the Greer plant went away to the fighting front. Many others continued to give their toil and sweat on the production front. Greer is proud of both and congratulates and thanks them for the Army-Navy "E" that they have won for the Greer plant.

On the ocean lanes of the world, Greer Conveyors continue to hoist the ammunition to destroyer gun turrets with deadly dependability. And at the Greer plant, night and day, Greer workers strive determinedly to turn out hoists and other vital war equipment faster, better.

The giant demands of war production have taught Greer much. We believe that this experience plus our engineering ability can be of great value to you in laying *your* plans for the peace time that is sure to come. Let us hear from you.—J. W. Greer Company, 119 Windsor St., Cambridge A-39, Mass.

MAKERS OF FAMOUS **GREER** **MULTI-TIER CONVEYORS**

BOILING ICE WATER
FOR INDUSTRIAL COOLING



STEAM JET REFRIGERATING UNITS

I-R Steam Jet Refrigerating units are widely used by modern industry. They provide important and unusual benefits.

Inside these units, you will find *only* "boiling ice water"—no other gas, liquid or brine. The units are quiet, vibrationless, economical and retain their unusual overload capacity for life. Steam costs come down in proportion to the load. Distinctive I-R design provides extreme simplicity of operation and control.

The Use of Water as a Refrigerant

At normal sea level, where the barometer reads 30" mercury atmospheric pressure, a kettle of water on a stove boils at a temperature of 212°F. During the boiling process, a large amount of heat is absorbed by the water as it is converted into steam (water-vapor). If the kettle should be carried to the top of a high mountain, where the atmospheric pressure is less than 30" mercury, the water would boil at some temperature lower than 212°F. At still higher altitudes the boiling point of water is further reduced.

When the pressure in the evaporator of a Steam Jet Vacuum Refrigerating Unit is lowered artificially to .36" of mercury absolute (29.64" vac.), the boiling point is reduced to 50°F. Water will then flash into water vapor which will carry heat away from the remaining unevaporated water until its temperature drops to 50°F. This "chilled water" is continuously circulated to the place where cooling effect is needed.

The heat required to convert one pound of water into steam is more than 100 times that given up by one pound of water in cooling from 60° to 50°. Therefore, a very small fraction (about 1%) of the "warm water" entering the evaporator can, by flashing into vapor, provide the refrigerating effect for cooling the remainder about 10°F.

To maintain the evaporator vacuum, each pound of water turned into vapor at the high vacuum is removed as rapidly as it forms by high-vacuum steam-jet boosters. The cycle is completed by condensing the compressed water vapor at a moderate vacuum in the usual manner.

Bulletins are available describing I-R Steam-Jet cooling units in detail. Consult the nearest branch office for full information.

Other I-R Products: Compressors, Pumps, Condensers, Blowers, Vacuum Pumps, Diesels, Refrigerating Unit, Rock Drills and Pneumatic Tools.

Atlanta, Birmingham, Boston, Buffalo, Butte, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Duluth, El Paso, Hartford, Houston, Kansas City, Knoxville, Los Angeles, Newark, New York, Philadelphia, Picher, Pittsburgh, Pottsville, Salt Lake City, San Francisco, Scranton, Seattle, St. Louis, Tulsa, Washington

Ingersoll-Rand

11 BROADWAY, NEW YORK CITY

812-13

EACH A RECORD BREAKER

BUT ONE HAS THE WINNING SPEED AND EFFICIENCY FOR YOU!

Today when time is so vital the three St. Regis Packaging Systems are doing their bit by shaving priceless manhours from the time once required to package an infinite variety of products. Because each of these systems sets new records on the job for which it was specifically designed, St. Regis has no favorite system. Following an on-the-spot survey of your packaging operation, we recommend *the* system best suited to *your* product—and *your* production needs.

The many industries changing over to Multiwall Paper Bags welcome the added protection given their products—and the savings in manpower and money effected by St. Regis Packaging Systems. These savings can be yours, too, if your product is baggable in rugged, custom-built Multiwalls, and is packed in 25 to 100 lb. units.

VALVE PACK — *Maximum Production and Minimum Labor* are outstanding features of the St. Regis Valve Pack System. Your product is preweighed by St. Regis Automatic Packing Machines (Belt, Screw or Impeller type) and rapidly propelled into valve type, self closing Multiwall Paper Bags. Gravity Type Packers are available for free-flowing products.

SEWN PACK — *Rapid, Uniformly Siftproof Closures* are assured open mouth bag users with the St. Regis Sewn Pack System. Automatic sewing machines apply a bound-over tape and filter cord, and quickly sew through all plies of the bag. Powdered products cannot work their way through this extra strong closure.

TIED PACK — *Greater Economy on Moderate Production* is achieved with the St. Regis Wire Tied Pack System. A hand twisting tool constitutes the entire equipment for effecting the securely tied closure around the neck of the bag.

Our experience in solving the packaging problems of varying industries may be of great practical help to you. A St. Regis Packing Engineer will be happy to specify the type of bag required for your product—and recommend the packaging system best suited to your production needs.

St. Regis Bags are built of 3 to 6 independent walls of specification kraft paper fabricated in tube form, one within the other, so each bears its share of the load. Chemical and physical properties of product determine number and weight of kraft and special sheets.

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS PAPER COMPANY

TAGGART CORPORATION • THE VALVE BAG COMPANY

NEW YORK: 230 Park Avenue

CHICAGO: 230 No. Michigan Avenue

IN CANADA

BATES VALVE BAG CO., LTD.
Montreal, Quebec
Vancouver, B. C.

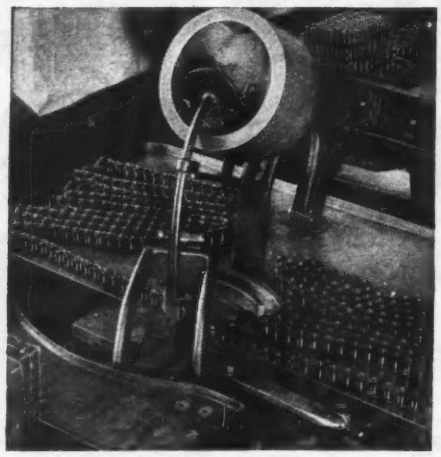
Baltimore, Md.
Kansas City, Mo.
Franklin, Va.

Birmingham, Ala.
Los Angeles, Calif.
Nazareth, Pa.

Dallas, Tex.
New Orleans, La.
San Francisco, Calif.

Denver, Colo.
Seattle, Wash.
Toledo, Ohio

better Methods that use fewer hands



Automatic cotter pin inserting machine for chain belt manufacture assures greater accuracy and uniformity.

Machine design methods, by taking over tedious and laborious tasks in industry, have helped to create in America a civilization which allows men to live as well as to work. An example of progressive machine design that solved a very difficult problem is this Baldwin-Duckworth cotter pin inserting machine for chain belt manufacture. It makes an automatic operation of a task that previously required much hand labor—and at the same time provides greater accuracy and uniformity in the finished product.

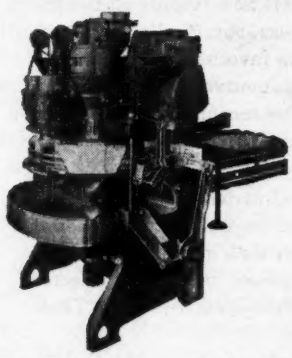
better Drives with Baldwin Roller Chain Belts

This and many other improvements in chain belts are of significance in the solution of drive problems which face both the machine designer and the maintenance engineer. Baldwin Roller Chain Belts insure accurate, split-second timing, deliver virtually 100% efficiency, absorb all shocks and give perfect maintenance of speed ratio. In fact, *roller chain belts are the only type of transmission that can absorb shock loading without loss of speed ratios and efficiency.*

Baldwin-Duckworth offers a comprehensive catalog on roller chain belts for the transmission of power and conveying materials. But for specialized applications involving any machine which you may be designing or redesigning, or which needs greater drive efficiency, call in a Baldwin man. He will be glad to work with you.

BALDWIN-DUCKWORTH Division of Chain Belt Company, 325 Plainfield Street, Springfield, Mass.

EXAMPLE



This packaging machine uses Baldwin Roller Chain Belts for

1. Unfailing split-second timing in operation
2. Perfect maintenance of speed ratios
3. Continuous, jerk-free smoothness of operation

IT'S BALDWIN-EQUIPPED

better Drives through better Methods

BALDWIN

ROLLER CHAIN BELTS

"What can Soy Flour do for me?"

An "invitation to learning" about some of the unique properties possessed by Soy Flour... and a word about the way Staley's food chemists can help you derive the full benefit of the advantages it offers the food industries.

SOY FLOUR is here to stay. The unquestioned merits of this modern "miracle food" have assigned it a role of growing importance in the world's dietary. But certain aspects of its usefulness in the food industries are still not widely understood.

This war-spurred product is *not* a wartime substitute. War has only underlined its importance, emphasized its advantages, accelerated its acceptance. Soy flour today enjoys a popular approval and prestige which make it doubly valuable commercially as a food ingredient.

Yet soy flour is *not* a food fad. It is a food fortifier, a food improver, a food enricher. Used properly in carefully computed proportions, soy flour not only adds concentrated protein value, but gives many foods a richer, tastier, more satisfying quality, while also improving their appearance, texture, and keeping quality.

Don't confuse soy flour with other flours. It is an entirely unique food ingredient, remarkably rich in certain substances, such as protein, vitamins, minerals, and lecithin, which make it valuable not only to bakers, but to confectioners, ice cream manufacturers, and food processors of many classifications.

Expansions now being completed will give A. E. Staley Mfg. Company the largest soy flour production capacity in the world. Our seventy-man research laboratory of food chemistry is at your service for developing formularies and methods of using soy flour to fit your needs. An inquiry on your company letterhead will bring you a booklet of procedures and experiences in your field, together with the answers to any questions you may have about what soy flour can do for you.

Staley's
CORN AND SOY BEAN PRODUCTS

A. E. STALEY MFG. CO.

Industrial Sales Division, Decatur, Illinois

HI-FAT SOY FLOUR LO-FAT SOY FLOUR STALEY'S SOY GRITS

Specify

GLOBE STAINLESS TUBES

FOR HIGH CORROSION RESISTANCE PLUS EXTRA STRENGTH AT HIGH TEMPERATURES . . .

Precautions must be taken in the selection of stainless steel tubing to assure satisfactory resistance to varying conditions of wet and dry corrosion and to provide extra strength where high temperatures are encountered.

For severe service conditions Globe Seamless Stainless Steel Tubes offer known protection . . . known assurance of sanitation, safety, corrosion resistance and uninterrupted service.

And for *extra* assurance of *added* safety and satisfaction, let Globe engineers consult with yours in selecting the stainless steel tubes for your particular needs.

Globe Stainless Tubes are produced in a wide range of sizes and analyses of chrome and chrome-nickel alloys.

We are glad to work with your engineers on tubing problems—make recommendations based on long experience, verified by practical and laboratory tests.

GLOBE TUBES

★ STAINLESS TUBES
★ BOILER TUBES
★ GLOBEIRON TUBING
★ GLOWELD TUBES
★ CONDENSER AND HEAT EXCHANGER TUBES
★ MECHANICAL TUBING

GLOBE STEEL *Tubes*

3003

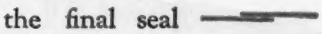
GLOBE STEEL TUBES CO., *Milwaukee, Wisconsin, U.S.A.*

TRAVELS THE "TRACO LINER" WAY

The BEST is none too good for *your* Frozen and Dried Eggs.

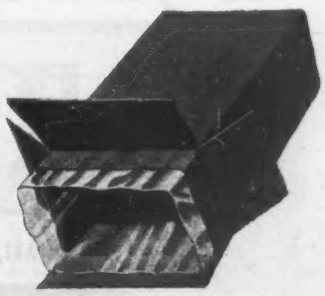
The Traco bag-in-box Liner with exclusive Tite-Seal* overlapping side seam offers extra strength which helps assure safe transport.

Notice that the inner seal allows for the expansion of freezing.

With the ordinary seam this expansion and the mere weight of contents tends to force sheets apart. But in the Traco Tite-Seal the sheets overlap so that the final seal  is protected and *holds*. These Traco Liners are made of special cellophane, compounded for the purpose.

* Patents Applied For

LOXTITE PARTITIONS • MULTI-PRINTED CELLOPHANE AND GLASSINE IN SHEETS, ROLLS OR BAGS • TRACO-PAKS • TRAVERSHEEN • TRAVERWRAP



TRAVER CORPORATION

358 West Ontario St. • CHICAGO, ILLINOIS • 404 N. Sacramento Blvd.

Your POST-WAR PRICES

must reflect

Your POST-WAR COSTS!

Memo from

POSTWAR PLANNING COMMITTEE

Please check up on transportation equipment before next meeting.

Better write the Trailmobile people-- to discuss our future needs.

You might also try Trailmobile service. Understand it's fast--and good. Have to keep our present equipment rolling.

To "*Get it there*" Faster and at Lower Cost . . .

ARMY (E) NAVY

TRAILMOBILE

COMMERCIAL TRAILERS FOR WAR AND PEACE

CINCINNATI, OHIO • **THE TRAILER COMPANY OF AMERICA** • BERKELEY, CAL.

Don't Sacrifice Familiar Features When Changing to a Wartime Package!

When you are forced to switch from the old, familiar container to a different package, be sure to preserve those valuable recognition features you have established over the years.

Let us show you how easy it is to retain your brand name, trade-mark and other identity characteristics in their established colors and design, even though the package itself undergoes a revolutionary change in materials, style, size or shape.

As one of the world's largest producers of packaging materials and fine Full Color Lithography, we offer you the benefits of experience, skill and ability to produce packaging of various types in sparkling Full Color at surprisingly modest cost. Write us today.

For over 75 years—headquarters for high-quality, colorful, lithographed labels, box wraps, packets, folding boxes, cartons, merchandise cards and envelopes, displays and advertising materials.

FREE!
Our 28-page book —"The Value and Patriotic Use of Full Color" tells how to get beautiful results at low cost. Write today for your *free* copy.

Contractors to the Government—War Work Comes First!

STECHER-TRAUNG
LITHOGRAPH CORPORATION

Rochester, N. Y. **San Francisco, Calif.**

Offices in Principal Cities

WHY THE PC BOAT CHANGED ITS COURSE

THE lookout on the PC boat stared again at the twinkling midnight sky.

"Must have been a falling star," he said half-aloud.

But, as he watched, a far-away point of light—red this time—rose above the horizon, lingered briefly . . . and disappeared.

The lookout clutched his telephone. "Bow lookout to bridge: Distress signal 3 points off the port bow, sir."

Seconds later, the PC boat swerved sharply and churned to the rescue.

The light which this sailor spotted is called a Very signal. Twelve signal cartridges—red—green—white—together with a hand projector are packed in a six-inch, air-tight can—a Canco container which has frequently meant rescue to the crews of foundering ships . . . a chance to fight again on the high seas.

To cans for Very Signals, add . . .

. . . complete torpedoes . . . fuse containers . . . demolition kits . . . hand grenades . . . containers for blood-plasma transfusion kits . . . first-aid kits . . . emergency field rations . . . and a host of other vital war products—all made by Canco.

In addition, Canco machine shops are devoting the greater part of their time to the production of specified basic machine tools for other war needs.

At the same time, the amount of food packed for the Army and Navy and the home front shows no signs of slackening. Indeed, last year more food was packed in cans than ever before.

These are some reasons why it was necessary to drop certain can sizes and why metal containers are no longer available for numerous consumer products.

Please understand, however, that this company is doing everything possible to "stretch" its metal supplies and to develop suitable substitute containers wherever possible.

AMERICAN CAN COMPANY
230 PARK AVENUE, NEW YORK 17, N. Y.

CANCO

CONTRIBUTE YOUR BLOOD TO THE RED CROSS

As you read this advertisement—stop and think—your blood could save the life of a wounded American soldier! If you live in or near one of the 33 cities in which blood-donor centers are located, call and make an appointment.

Free Enterprise

THE OPPORTUNITY AND OBLIGATION TO COMPETE

☆

WE can be prosperous beyond our dreams—all of us—workers, farmers, and business men—but one of the prerequisites is the self-discipline of accepting competition for ourselves as well as others.

* * *

Free enterprise does not imply the freedom to use any or all means to make a profit. It does not mean the right to monopolize. ***It means the opportunity and obligation to compete.***

Competition requires ***independence of action, free access to the market,*** and ***no large degree of control over the price*** by any buyer or seller. In general, the larger the number of sellers and the more easily buyers can shift from one seller to another, the higher will be the degree of competition (and vice versa for buyers).

But let us not get too academic or go off the deep end. We cannot have perfect competition. We cannot subdivide businesses and labor unions into tiny units to make a multitude of buyers and sellers in each market; we cannot reduce our rich variety of products to a few rigidly standardized items; we cannot educate people to judge quality precisely; we cannot eliminate the costs of bridging space between buyers and sellers. On the other hand, have we gone as far as is practical and desirable in these directions?

We cannot even have a system of highly "sensitive" prices, that is, prices which fluctuate immediately in response to every minor change in demand and supply. This would occur in the dream world of competition-to-the-nth-degree. It cannot occur in the real world, or even in the ideal world of competition best suited to physical facts and human qualities. The economies of large-scale enterprise, the need for adapting products to human wants, the costs of transportation and the costs of issuing and acquiring market information put severe limits on price sensitivity.

Economists tell us that if prices were extremely sensitive, business booms and depressions would be much less severe—provided our stock of money remained fairly constant. But with the somewhat limited degree of sensitivity which is practicable in the economy, price and wage changes cannot prevent severe declines in business activity. ***We cannot count on competition alone to cure depressions.*** We must look mainly to other kinds of measures to prevent mass unemployment of men and machines.

If we cannot have prices which fluctuate with every small change in demand and supply conditions, we can work toward—and achieve, if we really want it—a system in which prices and wages are at least roughly responsive to long-run changes in demand and supply, a system in which most markets are not dominated by individual businesses, groups of businesses, labor unions, or farm organizations, and in which prices and wages are maintained at levels consistent with free access to markets and to jobs.

In any kind of an economic system there must be some means of determining prices, wages, and profits, and of bringing labor and capital into employment in the industry and place where they are most needed. There are two ways to do this: by administrative fiat or by the impersonal processes of the market. The first of these is typical of the totalitarian state; it frequently involves destruction of individual freedom or fumbling mismanagement. During the war all of us have had some experience with patronizing and paternalistic treatment by the state; we have found out what it means to be pushed around by bureaucrats; and we have discovered that the political determination of prices, wages, and profits leads to chaos when self-interest supersedes the fine fever of patriotism—as it eventually does. I do not mean to imply that we can do without controls over prices, production, and distribution in time of war; but I do suggest that we can learn something from their operation. Even with a united national purpose these controls work badly when human abilities are inadequate for the superhuman task, when personal or departmental jealousies crop up among officials, and when pressure groups try to prey on the rest of the public. Every day more Americans are beginning to understand why our forefathers feared the caprice and tyranny of power.

The impersonal processes of the market in determining prices and wages and in allocating productive resources will, in normal times, save us from the fumbling of bureaucrats and from the Babel of confusion, un-

certainty, and annoyance produced by their regulations. But these market processes will not save us from paying toll to those who monopolize and restrict entry to markets or jobs.

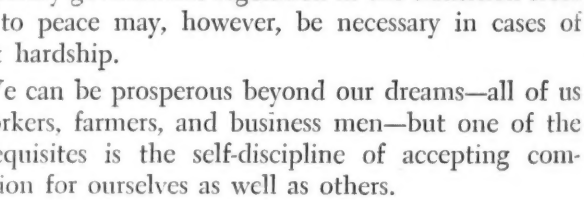
If we want an economy in which we are free to try out new ideas, develop new products, and introduce more efficient methods of production, if we want an economy in which there are great opportunities for men of imagination, inventiveness and energy, if we want an economy wide open to progress, then we must have a free field and fair competition for all comers—without collusion as to prices, markets, or production. This is the only basis on which we have a right to demand freedom from governmental regulation for ourselves and on which we can combat monopolistic tendencies in other quarters.

Let us stand squarely for the principles of the anti-trust laws and against all collusion and combination in restraint of trade. Let us insist that the government review with a critical eye every combination and consolidation which might restrict competition. Let us face frankly the problems of economic power arising out of price leadership and encourage every honest effort to find means to deal with them. Let us not shrink from questions as to whether some great aggregations of plants are too large for efficiency, free entry into the industry, and a free price. While we resist the efforts of the Department of Justice to extend the anti-trust laws by far-fetched and distorted interpretation, and while we fight every attempt to use them as a tool of persecution, let us cooperate in sincere efforts to modernize these laws and extend them by specific legislation to monopolistic practices they cannot now reach. I do not have a simple formula for this, but I believe we must try to find one.

We can then, better face the problem of the growing monopoly in labor which is threatening to make the free enterprise system unworkable. Today labor is going through a stage of empire building reminiscent in some ways of a similar stage in business three-quarters of a century ago. Witness the same buccaneering spirit, the same concentration on selfish interests, and the same disregard for the public welfare. Business leaders learned the hard way that the public will eventually rise up against those who prey upon them. Will our labor leaders be wiser? The right to collective bargaining to protect the weak position of the individual employee is one thing—but the grant of unlimited monopoly privilege to combine into a private government which can dictate its own terms to businesses, industries, communities, and even to the government itself, and which can start a wage-price spiral such as to hinder the war effort and make full prosperity impossible in time of peace is something quite different. We need to find a middle way which will prevent employers from exploiting employees but which does not sow the dragon's teeth. The exercise of arbitrary power by labor threatens not only business, but also all workers outside the unions and all those dependent on pensions and savings for their existence, and ultimately, of course, the well being of union workers themselves.

The idea that the labor problem can be solved if great, powerful organizations of employers will sit down with great, powerful organizations of labor is a delusion. If our experience in the N.R.A. and in the war teaches us anything, it is that the best that can be expected in the long run from such a situation is an armed truce with intermittent civil war. And every truce would be a monopolistic arrangement to take advantage of those not members of the great organized groups. Business and labor unions, whenever confronted with postwar readjustments that are unfavorable to them will be sorely tempted to protect their own special interests at the expense of the public. There will be efforts on the part of businesses, abetted by labor unions, to limit productive capacity, to raise tariffs, to obtain subsidies, and to maintain prices at artificially high levels. The unions will oppose labor saving changes and will seek higher wages even in areas and industries of surplus labor. Already demands are emerging for direct joint action by business, labor, and agriculture to solve the transition problems of special concern to them. While these groups should have every opportunity to register their own self-interest, we cannot entrust our fate to decisions made by pressure groups. If experience is any guide, such coalitions will be almost certain to restrict opportunities for progress and expansion, to exploit the public, and ultimately to injure even the businesses, workers, and farmers included in them. We cannot afford a postwar N.R.A. Resort to temporary government regulation in the transition from war to peace may, however, be necessary in cases of great hardship.

We can be prosperous beyond our dreams—all of us—workers, farmers, and business men—but one of the prerequisites is the self-discipline of accepting competition for ourselves as well as others.



President, McGraw-Hill Publishing Company, Inc.

FOOD INDUSTRIES

FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

LAURENCE V. BURTON, Editor

DECEMBER, 1943

Postwar Planning—V

Post-armistice Plans Depend Upon Tax Policy

WHAT is termed "seed-money"—to borrow a farmer's term—is recognized by all business heads as an essential postwar need of all industry. Seed-money is needed to invest in postwar businesses in order to get our normal peacetime economy going again. The more extensive has been the conversion of an industry to war work, the greater the need for seed-money to use in reconversion of a war plant to the uses of peace.

Most of the reconversion problems of the postwar period occur in the metal-working and chemical industries. Relatively little of the problem exists for food processors, for food is for human beings whose needs are practically alike whether they are fighting or at peace.

The McGraw-Hill Publishing Co. has long been campaigning actively for a Federal tax policy which will permit converted companies to accumulate reserves to be used to reconvert their businesses back to some form of activity that can be useful in the postwar period. Whether such concerns should resume their previous activities or do something else is a problem of far greater magnitude than faces all but a few companies in the food processing field. For this reason, postwar planning is of far greater importance to industries other than food.

But food manufacturers cannot escape the results of the planning of others, for on the success of others will depend the degree of reemployment of war workers. If other industries are generally successful and there is a high percentage of employment, the retail prices of foods will be high enough for profitable operation of the food industry. On the other hand, if employment should again run low, as it did in the depression years, the retail prices of foods must perforce sink to lower levels as people draw on their savings for existence and economize at every turn.

It is clear that the food processing industry has a huge stake in current tax policy even though large accumulations of seed-money are not needed to an extent comparable to the needs of a converted munitions maker.

Nevertheless, though the food manufacturer does not face such a need for seed-money, his future problems associated with conversion of other industries to peace ways cannot be so simply stated. He may still be manufacturing the same foods but he has many other problems to face in the near future. One of these is the policy of the government in settling of war contracts that someday will be suddenly canceled—when the enemy succumbs. War is a race in which neither side slows down as the finish line is reached. War's demands on industry will never be greater than on the day the enemy collapses. And on the day after that will come the beginning of a flood of cancellation of war contracts. These will involve few food contracts, for the armed forces must continue to eat. Indeed, it is likely that government purchases of foods will be increased in order to bring relief to starved captive nations. But there are perplexities aplenty ahead.

CANCELLATION of nonfood war contracts will have its greatest effect on subcontractors, who will not have much seed-money for reconversion unless the Federal tax policy is notably modified—something that appears unlikely to occur before the next election. Employment by subcontractors is likely to be reduced rapidly, even instantly. Subcontractors may even be forced to wait for money due from prime contractors who, in turn, will have to wait until the Controller-General of the United States has had his say about the terms of settlement. All this will have a bearing on policies of food manufacturers who have a high percentage of their distribution in munitions-producing areas.

Some prime contractors—like Ford, General Motors, General Electric, Chrysler, Bethlehem or Big Steel—will experience less hardship from delayed settlements of prime contracts. But the same cannot be said of some other prime contractors. For example, investigations of the financial resources of one of the large aircraft manufacturers has revealed that its working capital is equivalent to only two and one-half weeks of its payroll! This, be it noted, is not cash on hand but is total working capital, which clearly indicates that when a cancellation comes the entire huge working force is likely to be dismissed

about as fast as payrolls can be made up and the help paid off.

To any food manufacturer with a stake in such an area, this sort of an exodus of customers would require prompt action, especially if he were an operator with contracted supplies coming from afar. Fluid milk would typify such a case. While operators in the field of highly perishable foods are noted for their ability to cope with unexpected crises, the problem is one that can be lessened if the situation has been surveyed previously and plans have been arranged for just such an eventuality.

Without seed-money in the form of cash reserves in the hands of war contractors, the food manufacturer who serves the employees of the war contractor is in the same boat. And if the war contractor closes up, the local food manufacturer will be facing a near-panic unless he prepares now.

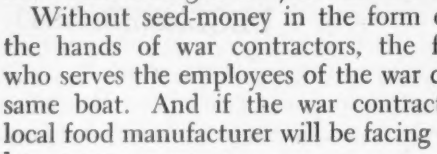
Of course, if the government's tax policy should be revised to permit accumulation of seed-money reserves, the food processors' post-armistice problems will be cushioned, though not removed.

IN EXAMINING the problem of postwar planning for the food industry, it is important that no one shall relax his war effort. Merely because one begins to plan for the end of the war and decides what he shall do "when, as and if," nobody should let down on the primary effort, which is to help win the war. A man who buys life insurance, an annuity or hospital insurance is preparing as best he may for the future without in any way letting down on the business of living. That is the spirit in which all should approach postwar planning.

L. V. Burton EDITOR

The Talk of the Industry

• FIVE associations of undertakers are cooperating with OPA's rationing efforts. When a person dies the mortician fills out Form 192 R which



notifies the local board to go after the deceased's ration books. Evidently this is a possession that cannot be willed to anyone.

• THE index to the current volume of FOOD INDUSTRIES is not bound into this issue as heretofore. You have been warned for the past four months about how to get the annual index.

• THE paper shortage is on in earnest. For selfish reasons every one should conserve as much as possible in all uses of paper and be sure that no paper is destroyed. All used paper should be salvaged and sold to the waste paper trade for remanufacture.

Remember that there is no such thing as battle scrap in paper. Battle scrap is junk battle equipment that is returned from overseas for remelting.

• PROGRESS NOTE. The existence of such an industry as food processing was twice admitted in F.D.R.'s food message to Congress. But the rest of his message omits any suggestion that there is an indispensable operator between the farm producer and the distribution trade—the food processor.

• DOUBLE TAXATION. A certain lady whose wealth constitutes nearly all the capital of two corporations has discovered that for each dollar these corporations earn, the government takes more than 80 cents, after which she pays her personal income tax on her dividends. Her own net, after taxes, is 6 cents out of each dollar the two businesses earn before Uncle Sam gets in his double whack of taxes.

She gets for her own uses, not 6 percent on her money, but only 6 percent of the net corporate earnings before taxes.

The Challenge of 1944

Only two short years ago the Axis nations, led by Japan, declared war on the United States. Yet even before that attack it was apparent that food supply and food processing problems would loom large in the affairs of this nation in the year 1942 and the ensuing years. How large the problem has grown is now easily seen by any one old enough to own a ration book. But the end is not yet.

With Great Britain on very strict rationing, with India in famine, Australia now beginning to ration its food supply and New Zealand worried about the future of its own foods, the supply problem of the United Nations becomes more grave.

But what of the demand for food which these nations must meet? In spite of the limits to our resources the demand is expanding. Russia is importing foods in preference to munitions. Every captive nation that is liberated must receive enough food to sustain life for a year or millions will perish.

The Germans must not only be defeated in a military sense, their diabolical plans to kill off or starve out the populations of neighboring countries must also be defeated. Bombs and guns in sufficient quantity will destroy the German military might, but nothing but food can avert the wholesale destruction of entire captive populations.

As 1944 approaches, it is plainly to be seen as a crucial year in the affairs of mankind. Military strategists see it as the year of total defeat of Germany. Political strategists and the planners for the welfare of man see it, however, as the beginning of the greatest war against starvation within recorded history.

Notable changes in our habits of eating must be made if the world war against starvation be won. For one or two years, and perhaps three, the trend will be toward direct-consumption foods. These are the foods where man eats the crop directly instead of feeding it to animals and then eating the animals or their products.

Yet as soon as we face this dietary change there immediately arises the need for more, new and improved processing facilities. And there will

be fewer persons available to help process these foods into forms that are palatable. To cope with the problems of 1944 and 1945 the food processing industry needs new equipment, new processes and labor-saving plans. It needs plants that are so automatic and so fool-proof that a minimum of technical supervision is necessary.

This is the challenge of the coming year. Prepare to meet it while you may. To postpone action may mean the loss of many human lives in the secondary battle against starvation.

The President On Food Subsidies

In the short view the President's argument in favor of food subsidies, supplemented by Chester Bowles' plea before the Grocery Manufacturers of America, is rather effective. The short view is, however, not the only view that must be taken on one of the fundamental questions of our time.

Regardless of all preconceptions of the virtue or evil of the subsidy, each must ask himself which is the more important—prices or production? If the answer is prices, then that person is only ankle deep in the war. Advocates of the subsidy argue that this device is needed to get the needed production. Their principal plea is that the subsidy is cheaper than directly paying the actual cost. (This has been denied by a resolution of Grocery Manufacturers of America.)

In the long view there is another matter to be reckoned with, for many Washington leaders hold that our national debt will soon be so large that only a general increase in prices and wages will make the debt service (interest to you) endurable. If that is true then there is no virtue in subsidies at present to stop price increases to be followed by voluntary price and wage increases to ease our debt burden. For such a postponed price-hike would penalize everyone who buys war bonds today.

And then, admitting also the danger of bureaucratic dictation, there is the political angle. To close the so-called inflationary gap the political economists say the people's cash (euphemistically called "excess purchasing power") must be drained off by taxation. While it is freely admitted that the "excess purchasing power" is chiefly in the hands of highly paid millions of war-industry workers who can't or won't save their money, the politician abhors the sales tax as a remedy because it falls most heavily on those in the lower income brackets who always constitute a majority of the electorate.

The big question to be settled is: Do we or do we not want to take this money away from them by a process which they can understand, so that they know they are being relieved of a part of their wages and why? If the big decision is that they should know they are being taxed, then higher ceilings plus the sales tax are better than the subsidy. But if our big politicians feel that the dear people must not know how or why they are being taxed, then the subsidy is an artful way of concealing it.

It is not easy to reach a clean-cut decision as to whether to support or oppose food-subsidy payments. Being convinced that intellectual honesty and candor are more conducive to wisdom than sophistry and half truths, FOOD INDUSTRIES takes the stand that the subsidy to hold down food prices is only a temporizing device to postpone the inevitable. If the present Administration and Congress were inclined to deal realistically with *all* the factors that go into rising costs without an eye cocked to November, 1944, arguments for the subsidy would be so inocuous as to be unnecessary.

New Problems Of Food Storage

Food which is consigned to storage in public warehouses is often thought to be in safe hands if the warehouse company is financially sound and the foods are properly insured. So some folks think. So most of us have optimistically thought. But it is different now and insects and weevils are not the only problems. There is the little problem of rats to be carefully considered. For there is now a way to ascertain if the rats in the warehouse have defiled and contaminated the products stored there.

A portable ultraviolet lamp has been developed by Food and Drug Administration. Inspectors carry it around the dark warehouse and if anything fluoresces—shows a colored glowing

Hors d'Oeuvres

• A Federal district judge has denied a beverage bottler the right to use the words "Koke" or "Coke" because to do so would be misrepresenting his product as "Coca-Cola." Wonder who has the right to the "three-ring" symbol, Ballantine or Barnum?

• *Have you heard about the famous food folly of this war? Tropical butter, carefully constituted so that it won't melt in the tropics—some say it won't melt in your mouth—was supplied to troops in Alaska and the Aleutians. It was so hard the men couldn't eat it. In fact, 'tis said that a warehouse burned without melting the stuff—perhaps a slight exaggeration. Anyway an ingenious sergeant found a use for it —greasing the skids of pile drivers.*

• To keep absenteeism low, American Can Co. has established a unique Employees Service Bureau at its Amertorp plant in Forest Park, Ill. The Bureau does routine personal chores for workers and assists them with numerous personal problems. It even gets tickets for social functions. Apparently it does not deal in telephone numbers.

• *A glass of beer supplies about 150 calories, a fact which might be used as one of those excuses people are always looking for.*

• The offspring of salmon transplanted to a new location in the Columbia River returned to that location at spawning time, and did not try to get back to the spawning grounds of their ancestors. This throws another age-old "fact" into discard and proves that fish know more about their business than people.

Because it is a valuable source of vitamin A, the ugly, shark-like dogfish is making a definite contribution to the success of night flying pilots. It is helping to put the bite on the Nazis.

• Two tin cans out of every three that could be salvaged are being thrown away, reports the OWI. Sure takes a spell for word to get around that there's a war on.

• *Roasted porcupine with dressing and sweet potatoes makes a tasty dish, say the firemen of station No. 7 in Spokane, Wash., who roasted one that was a casualty from tree cilmbing. And this is one dish that comes complete with the toothpicks.*

• The tin cans that made Hawaiian pineapple famous are now helping to protect Honolulu from enemy air attack, used cans being converted into bonnets which shield the glow of the city street lights. But the chances are that the Nips won't get a chance to blow the lid of Honolulu again.

• *In OPA's Home Front Pledge Campaign, more than twelve million housewives and other consumers have given their word not to patronize blackmarkets. It is to be hoped that too many of these women do not exercise their traditional privilege of changing their minds.* F. K. L.

area—the inspector knows that the fluorescent substance is rat urine. If the product is in a burlap bag the fluorescent area is marked, the bag is cut open and some of the contents removed for analysis. The presence of urine is proved sufficiently for the satisfaction of the courts by a quantitative analysis for urea.

Then the product is seized, libeled, condemned and the owner is out of a lot of money. And precious food is lost. Seizures running into many hundreds of bags of food are not unusual.

Between August, 1941, and February 28, 1943, flour to the extent of 14,523,506 lb. was seized for filth and contamination. This includes all causes.

There are clauses in the Federal Food, Drug and Cosmetic Act [see Section 402(a) (1) and Sections 301, 304, and 704] which permit seizure and prosecution where the food is stored under conditions where it may have become contaminated, and the Food and Drug Administration has a Congressional mandate to proceed by injunction against the warehouse company to restrain it from thus adulterating the food.

What's the answer? Clean, good bags if of burlap, or else clean multiwall paper bags; clean freight cars, free from infestation; clean warehouses, free from insect and rodent infestation; an alert technical man, who can't be pooh-poohed, to check up periodically; and contractual relations with warehouse companies that make them responsible for such losses, and eternal vigilance.

More Than Money Needed For Successful Research

Henry A. Wallace, Vice-President of the United States, has seen fit to lend his support to the fallacious Kilgore Bill to create an Office of Scientific and Technical Mobilization. His testimony at a hearing on the bill is interesting, for it illustrates an erroneous concept of research and how it is done. As quoted by Associated Press he said:

"The application of modern science should not be the exclusive domain of great corporations and cartels who can, if they desire, restrict and suppress new inventions and scientific information to suit their own interests instead of the public interest. . . .

"Small business cannot support the large and costly laboratories which are necessary for modern industrial research. To fill this need Government must make available these facilities. . . .

"I know full well that there are great fields of necessary research which cannot and should not be entrusted to the sole control of private companies whose primary aim is to further the interests of their stockholders. These companies, particularly the larger ones, are doing a fine job of industrial research. However, one needs to focus attention, not upon the advancement which has been made but rather than upon that which might have been made and was not."

There is enough in the foregoing remarks to brand Mr. Wallace as one who knows very little about the processes by which an idea is converted through research to industrial reality. Space does not permit a lengthy examination of his misunderstanding, and were he not the present occupant of the second office in this nation his ideas would not merit consideration. But, after all, he *is* Vice-President and his voice carries much farther than his information deserves.

Discovery—Long Way From Success

Let's dispose of the suppression of new inventions and scientific discoveries first. If inventions and discoveries are not patented, then any one else has the privilege of rediscovery, patenting and use—if he knows how. If, however, they are patented and the patent is not utilized, there may be reasons other than sheer cussedness for failure to exploit the patents. But if cussedness is the motive, the remedy lies in the power of Congress to change the law of patents.

It is possible that Mr. Wallace does not realize the difference between a method, *i.e.*, a patentable principle, and a fully developed process or machine. The invention may have been inexpensive while its development to a commercial success may still cost huge sums. Such information as is available does not indicate that the Kilgore Bill would carry the results of research through the development stage or still farther into the actual commercialization. Anyone who takes the trouble to investigate will find there are thousands of patents issued every year the owners of which are looking for exploiters throughout their patent life. And the Alien Property Custodian owns thousands of patents that can be licensed for $5.00, with very few takers.

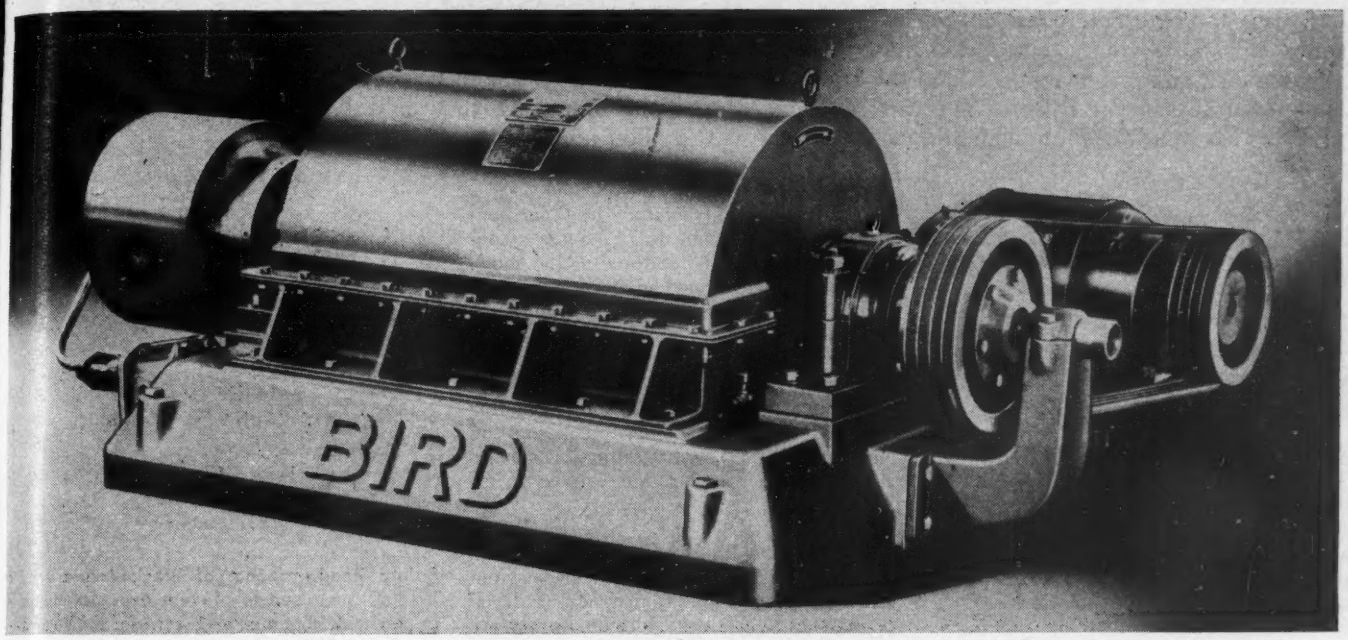
Money Helps—But Other Things Needed

More important than that, however, is the omission from Mr. Wallace's thinking or knowledge, of the need for research-minded top management of corporations if the research tool is to be successfully used. Mere possession of great corporate wealth does not carry with it the requisite intelligence to utilize research to further its own ends. For instance, there are today two large corporations of enormous wealth which are disbanding research departments, letting good research men go. Which is not to say that these corporations will suffer immediate loss of net profits; indeed, the net figures may temporarily go slightly higher after eliminating the cost of research. But the time will surely come when competitors who know how to use research will achieve a position where the former will regret their decision to stop it. This is not an occasion for shedding tears, however, but it shows how irrelevant is Mr. Wallace's plea that small businesses cannot support large and costly laboratories. For here are concerns which could do so and have decided against it.

Investigation will reveal that the concerns which today maintain the large and costly laboratories did not start out big, nor did they have large research budgets at the outset of their research careers. Usually the noteworthy feature of the success story in corporate affairs is the presence of a top executive with definite, well-grounded ideas of what he wanted, plus enough force and driving power to get the research done that would give him what he knew would be a commercially exploitable invention. Companies that lack at least one such man are usually followers—waiters for some one to come around and sell them what the outsider knows the company needs far better than the management.

Given a company which has a research-minded, forceful top man, the initial research efforts will be modest, but as time goes on the company will grow and research efforts will multiply until they attract the attention of men of Mr. Wallace's philosophy.

One cannot insure the millennium by Federal appropriations for research—nor even by corporation appropriations. Money alone won't do it. It takes ideas first, then men, then money. Men with ideas generally connect with money which is ever seeking better ways to work. Mr. Wallace apparently lends his support to the third factor without realizing the first two—the more important ones.



The Bird continuous centrifugal filter finds application in the food industries in various drying and dewatering operations.

This Exposition Can Aid In Postwar Planning

With equipment rapidly wearing out under continuous operation, and few replacements available, food manufacturers should take this opportunity to plan actively for postwar plant improvements

FROM December 6 to 11, 1943, the Nineteenth Exposition of Chemical Industries will fill Madison Square Garden in New York City with exhibits of equipment, supplies and materials. As is usual in these expositions, most of the exhibits are as important to the food industries as to the chemical industries. In fact, the exposition might well be called an "Exposition of Processing Industries."

This year the exhibits are more important to the food industries than ever before, for they afford an opportunity to begin one of the most important phases of postwar planning. Until very recently, food processors have been unable to get any new equipment. Meanwhile, under the increasing demands of war, food plant machinery has been operating day and night—wearing out at a rate never before reached.

As a consequence, there is no food plant that does not need new equipment, and all expect to obtain this as soon as possible after war restrictions are lifted. And, in planning for this equipment, most manufacturers hope if possible to obtain something better than they have been using—to reap as much benefit as they can from the improvements in machines and materials that have grown out of the war.

To see what some of the plans are for such equipment replacements, FOOD INDUSTRIES recently interviewed many operators of large, medium and small sized food plants. The results of these interviews were enlightening. There is not space to quote at length here, but some of their statements follow:

"We expect to order faster, more efficient machines."

"The war has made new materials available. We plan to make use of these in improving our equipment."

"After the war, we will make more use of refrigeration."

"Comfort air conditioning is needed in our plants, to improve working conditions. We are in the market for this equipment after the war."

"Continuous production equipment, in place of batch equipment is the coming thing in our industry. We will be in the market for such equipment after the war."

"After the war, we plan to rush our orders for new equipment. The equipment suppliers will have many orders and we want to get ours in first."

"Right now we need improved packaging equipment and processing equipment that has better heat control, is safer to operate and easier to clean."

"During the war we have experimented with plastics as a material for construction of equipment and pipelines. This has proved satisfactory and we expect to use it more widely when available."

"We are interested in obtaining electronic controls."

"As soon as available, we want new and better valves."

These are some of the comments made to us by food processors and they indicate a general interest in new and improved equipment.

If you, too, are interested in replacing your worn equipment and obtaining better and more efficient machines and supplies, you should attend the Exposition of Chemical Industries. For those who can't be there, the following list gives the equipment and materials that will be shown, with particular mention of the new items. This list contains all the information FOOD INDUSTRIES was able to obtain before going to press and, if there are any omissions, they exist because the information was then unobtainable.

Abbe Engineering Co., 50 Church St., New York, N. Y.—A pictorial display of mixing, grinding and processing equipment and a variety of special processing mills generally intended for combination processes will be shown.

Ace Glass, Inc., Vineland, N. J.—Laboratory glassware will be on display.

Acme Steel Co., 2840 Archer Ave., Chicago, Ill.—A new angle-head Silverstitcher designed for speedily closing bags, together with motor-driven carton and drum stapling machines, steel strap applying equipment, steel straps and equipment for wire stitching of containers will be on exhibition.

Air & Refrigeration Corp., 475 Fifth Ave., New York, N. Y.—Capillary type air conditioners used for a variety of liquid-gas contacting applications such as humidifying and dehumidifying, also absorption and tower packing will be shown.

Alberene Stone Corp. of Va., 419 Fourth Ave., New York, N. Y.—A variety of stone laboratory equipment consisting of regular and 25 grade Alberene stone will be exhibited, including a sink and drainboard, also table tops and fume hoods.

Louis Allis Co., Milwaukee, Wis.—Specially protected motors for the processing industries and a new motor triply protected against damage from liquids and dust, as well as explosion, will be exhibited.

Aluminum Co. of America, Pittsburgh, Pa. —A liquid-circulating system with various stations at which laboratory tests are conducted to demonstrate this company's consulting service will be featured at the show. The exhibit will also demonstrate the economic advantages of aluminum alloys in processing plants.

Aluminum Ore Co., Pittsburgh, Pa.—Products derived from aluminum ores, including activated aluminas for moisture adsorption and catalyst use, plastics, drugs, cosmetics and many other applications will be on exhibition.

American Hard Rubber Co., 11 Mercer St., New York, N. Y.—Products made from synthetic rubber, and from Saran, a development of vinylidene chloride, to replace natural rubber in many uses such as tank linings and pipe will be emphasized at the exhibit.

American Instrument Co., Silver Spring, Md.—Laboratory and test equipment such as a circulating cooler, immersion and air heaters, regulators, and spectrophotomotors will be shown. A new sub-zero test cabinet for low temperature testing will be exhibited, together with a new gloss meter known as the Gonio photometer, in this company's booth.

H. Reeve Angel & Co., Inc., 7 Spruce St., New York, N. Y.—Whatman & Reeve Angel filter papers for laboratory and plant use will be on exhibition.

Ansul Chemicals Co., Paoli, Pa.—On exhibition will be Du Gas fire extinguishing equipment.

Safety head, product of Black-Sivalls and Bryson, Inc., used to prevent over pressures in air conditioning and refrigeration systems and all sorts of pressure containers.

Artisan Metal Products, Inc., Boston, Mass. —Special fabricated process equipment will be shown.

Associated Cooperage Industries of America, Inc., St. Louis, Mo.—The exhibit wlil consists of kegs, barrels and other cooperage products.

Baker & Co., Inc., 113 Astor St., Newark, N. J.—Designed to show the important role played by platinum in war and peace, the exhibit will display a variety of platinum and platinum products such as platinum wire and ribbon for use in electronic devices.

Baker Perkins, Inc., Saginaw, Mich.—A laboratory mixer of the kneading type for general purpose use will be shown.

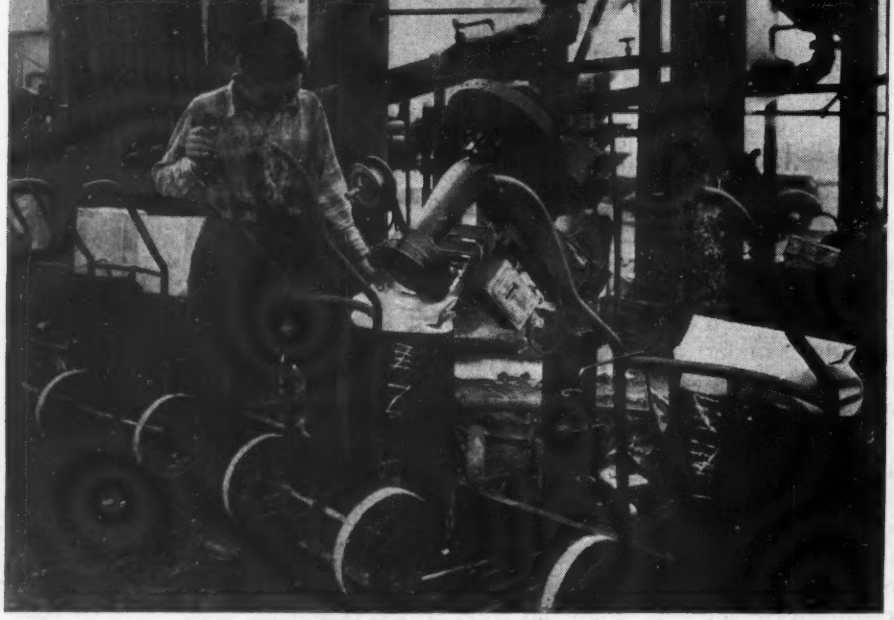
Barnstead Still & Sterlizer Co., 2 Lanesville Terrace, Forest Hills, Boston, Mass.— Water stills in steam, gas and electrically heated models will be featured at the show, as well as a new water purity meter for checking the quality of distilled water.

Barrett-Cravens Co., 3255 West 30th St., Chicago, Ill.—Exhibited at the show by this company will be materials handling equipment such as hand-lift trucks and stackers.

Beach-Russ Co., 50 Church St., New York, N. Y.—A pictorial display of wet and dry high-vacuum pumps will be shown. Also shown will be an RP high vacuum pump of the type used on vacuum packing machine and in food concentration.

Bemis Bros. Bag Co., 601 So. Fourth St., St. Louis, Mo.—Bags for packaging various products will be on exhibition. New at this show is the "Aquatex" closure for multiwall bags, for excluding moisture and vapor from the filled containers.

Bird Machine Co., South Walpole, Mass. —A Bird continuous centrifugal filter to show construction details, supplemented by cross sectional diagrams; and installation pictures of continuous solid bowl centrifugal



Machine made by Acme Steel Co. for closing bags of food products, chemicals, and other materials.

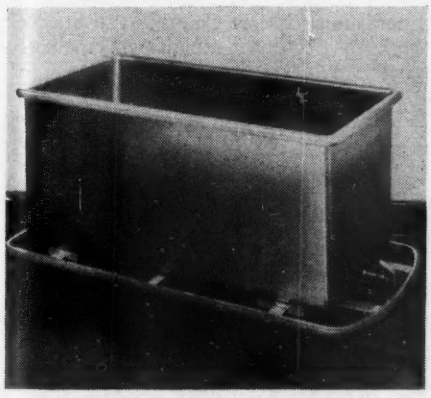
filters and continuous centrifugal classifiers will be exhibited.

Black-Sivalls & Bryson, Inc., Kansas City 3, Mo.—A new type vacuum support for safety head diaphragms will be shown, as well as safety equipment for pressure relief.

Blaw-Knox Co., Pittsburgh 30, Pa.—Flow sheets and engineering data on various processing operations, including solvent recovery and purification.

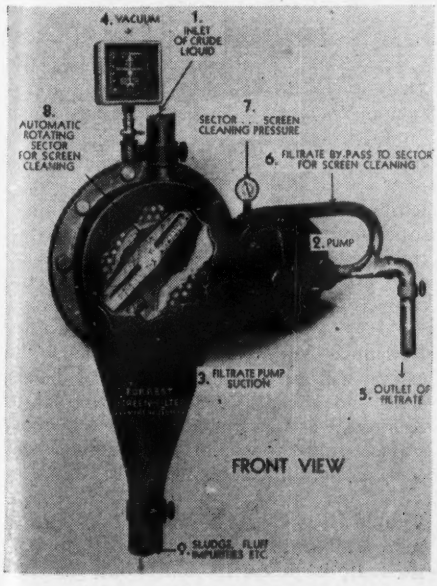
Brabender Corp., Rochelle Park, N. J.—Testing equipment such as a semi-automatic moisture tester, recording viscosimeters, viscographs to record viscosity and temperature at the same time and a plastograph will be exhibited by this company.

S. Blickman, Inc., Weehawken, N. J.—Processing equipment of stainless steel and alloys will be shown at the exhibit, and a feature will be "Corresite," a new corrosion resistant plastic for fabrication into process equipment.



Stainless Steel Food Truck fabricated by S. Blickman, Inc.

Bramley Machinery Corp., 15 Park Row, New York, N. Y.—A combination grinder, mixer, refiner and homogenizer for paint,


4. VACUUM
1. INLET OF CRUDE LIQUID
8. AUTOMATIC ROTATING SECTOR FOR SCREEN CLEANING
7. SECTOR SCREEN CLEANING PRESSURE
6. FILTRATE BY-PASS TO SECTOR FOR SCREEN CLEANING
2. PUMP
3. FILTRATE PUMP SUCTION
5. OUTLET OF FILTRATE
FRONT VIEW
9. SLUDGE, FLUFF IMPURITIES ETC

"Forrest" screening-filtering machine for viscous and other liquids, made by Bramley Machinery Corp.

chemicals and food products will be exhibited, and the new feature of the exhibit will be a combination screening and filtering machine for viscous and other liquids.

Edward G. Budd Mfg. Co., Philadelphia, Pa.—Several typical applications of this company's system of resistance welding on light weight stainless steel, as thin as 0.03 in., will be exhibited.

Bump Pump Co., LaCrosse, Wis.—Rotary pumps of sanitary and corrosion resistant types.

Cambridge Instrument Co., Grand Central Terminal, New York, N. Y.—Industrial instruments and testing equipment, including a new 4-point automatic gas analyzer in operation which continuously and simultaneously records oxygen and other gases, will be on exhibition.

Carpenter Container Corp., Brooklyn, N. Y.—Fiber shipping drums for dry and semi-liquid products will be shown by this company.

Carpenter Steel Co., Roselle, N. J.—Processing equipment and parts constructed of welded stainless steel tubing will be shown.

Coleman Electric Co., Maywood, Ill.—Electrical laboratory instruments such as spectrophotometers, and electromoters will be exhibited by this company. Also shown will be their new clinical spectrophometer for field hospitals, and new buffer tablets for pH measurement.

The Container Co., Van Wert, Ohio—This company will exhibit the "Stapak," "Fiberpak," and "Leverpak" fiber shipping drums for foods and chemicals.

Corning Glass Works, Corning, N. Y.—Various kinds of industrial and laboratory glassware, including precision gages and accurate-bore tubing, will be shown. New developments will include bacteriological filters in extra-fine porosities and "actinic" glassware. Glass piping, fittings and gaskets will be exhibited, also ball and socket joints to facilitate assembly of laboratory apparatus. Shown for the first time will be the "Corad" distillation unit.

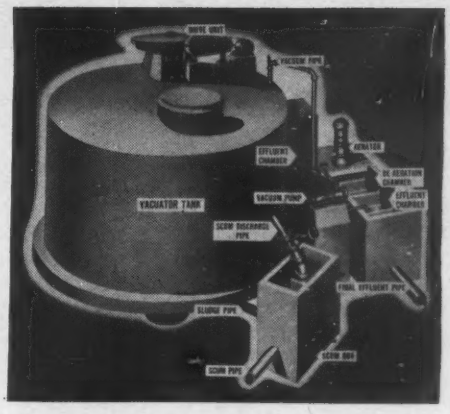
Darco Corp., New York, N. Y.—The exhibit will consist of activated and decolorizing carbons.

Denver Equipment Co., 1400 Seventeenth St., Denver, Colo.—Flow sheets of processes in which flotation is employed will be exhibited by this equipment company.

DeBothezat Ventilating Equipment Division, American Machine & Metals, Inc., East Moline, Ill.—Eighteen-inch Bifurcator fan for removing dangerous fumes, gases and dust-laden air will be shown.

Dicalite Co., 120 Wall St., New York 5, N. Y.—Diatomaceous earth products such as filter aids and extenders will be on exhibition.

Dorr Co., 570 Lexington Ave., New York, N. Y.—A device for making a three-product



The "Dorrco Vacuator", for use in separating light, difficult-to-settle solids, is made by the Dorr Company.

separation, an improved hydraulic classifier; and two pieces of equipment for size separation—the Dorrco Vacuator and Hydrosizer—will be shown by this organization.

Duriron Co., Dayton, Ohio—Two types of circulating steam jets, Duriron and stainless steel centrifugal pumps and valves and alloy steel castings will be shown at the exhibit. The company will also display a number of 300-lb. alloy steel plug valves.

Eastern Engineering Co., 45 Fox St., New Haven, Conn.—Midget centrifugal pumps are among the equipment to be shown at the exhibit by this company.

Economic Machinery Co., Worcester, Mass.—"World" labeling equipment for packaging lines will be featured at this booth.

Thomas Edison, Inc., Industrial Instrument Division, West Orange, N. J.—Control equipment such as electric thermostats, thermal relays and pressure gages will be shown.

Eimer & Amend, 635 Greenwich St., New York, N. Y.—Laboratory ware, apparatus and instruments will be exhibited by this chemical company.

Electro-Chemical Supply & Engineering Co., Paoli, Pa.—This company will show "Duro" acid-proof brick and tile, and cements, suitable for floors, tanks, sewers, and other construction work.

Charles Englehard, Inc., Newark, N. J.—Control instruments will be exhibited at the exposition by this organization.

Eppenbach, Inc., 44-02 11th St., Long Island City, N. Y.—Colloid mills and homogenizing mixers will be on exhibition, with an improved design of the "Homo-Mixer" featured.

Ertel Engineering Corp., 40 West 48th St., New York, N. Y.—Asbestos disk filters for bacteriological work and industrial use, plastic pump units, and bottling machinery will be shown.

Eutectic Welding Alloys Co., 40 Worth St., New York, N. Y.—The use of low temperature welding alloys for fabrication,

reclamation and salvage will be demonstrated, as well as several new developments in the rebuilding of worn or corroded parts with alloys, and alloys for gas and arc welding of copper.

Exact Weight Scale Co., Columbus, Ohio—A number of production, sacking and check-weighing scales will be shown, including new scales with electronic operation and an electronic tare compensator.

Falstrom Co., Passaic, N. J.—Steel instrument mounting structures, such as panel boards fitted with instruments, will be shown.

Fansteel Metallurgical Corp., North Chicago, Ill.—Acid-proof process equipment will be exhibited, as well as a new burner for the production of synthetic hydrocholoric acid and a cooler for corrosive gases.

Fischer & Porter Co., Hatboro, Pa.—Rotameters for measuring flow and precision-bore glass specialties will be among the equipment exhibited. The exhibit will also

"Rota-Sight" flow rate indicator and "Rota-Sight" alarm, made by Fischer and Porter Co., for protection against low flow or excess flow in such equipment as filters.

include new recording controlling flow-rate rotameters with pneumatic actuation. The latest developments shown will be the "Rota-Sleeve" area meter for metering large rates of flow and a self-operated Rotameter controller.

Fletcher Works, Inc., Glenwood Ave., & Second St. Philadelphia, Pa.—A 24-in. suspended type centrifugal with a stainless steel imperforate basket and a laboratory size perforate basket centrifugal will be on exhibition.

Foster Wheeler Corp., 165 Broadway, New York, N. Y.—Dowtherm equipment, such as is used in heat processing of food and other products, will be shown.

Garlock Packing Co., Palmyra, N. Y.—The exhibit will include mechanical packings for fittings and machines.

Laboratory centrifugal, 12-in. size, with perforated basket, made by Fletcher Works.

General Ceramics Co., Keasbey, N. J.—Chemical stoneware processing equipment as well as a new line of white, iron-free chemical ware and white glazed table tops will be shown by this company.

Goslin-Birmingham Mfg. Co., 350 Madison Ave., New York, N. Y.—The McCaskell rotary pressure filter will be exhibited by this company.

Graver Tank & Mfg. Co., 332 So. Michigan Ave., Chicago, Ill.—Water treatment equipment will be on exhibition at this booth.

Grinnell Co., Providence, R. I.—Pipe fittings, adjustable pipe hangers, valves and sprinklers will be shown.

B. F. Gump Co., 431 So. Clinton St., Chicago, Ill—This exhibit will include the "Draver" feeder, "Vibrox" barrel packer, "Bar-Nun" rotary sifter, and "Bar-Nun Auto-Check" net weigher, all used in the processing and packing of food products.

Lancaster Iron Works Symbol TM laboratory size mixer, for handling batch formulas of many various characteristics.

Hanovia Chemical & Mfg. Co., Newark, N. J.—Ultra-violet radiation producing equipment will be on exhibit.

Hardinge Co., York, Pa.—Models and pictures of Ruggles-Coles rotary dryers, and grinding, thickening and agitating equipment will be on display.

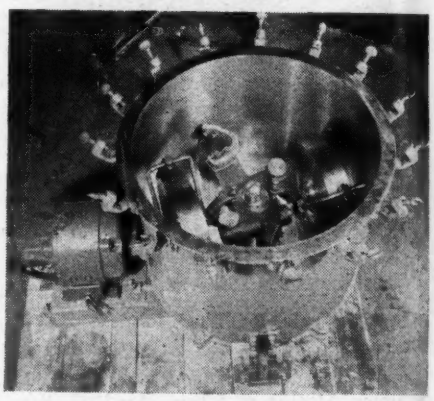
Haveg Corp., Newark, Del.—Processing equipment fabricated from plastic materials will be shown at the exposition.

Hersey Mfg. Co., E and 2nd Sts., South Boston, Mass.—Photographs and color drawings of rotary dryers will be shown.

Illinois Testing Laboratories, Inc., 420 No. LaSalle St., Chicago, Ill.—Temperature, dewpoint and air velocity instruments will be exhibited by this company.

Industrial Instruments, Inc., 156 Culver Ave., Jersey City, N. J.—Electrical conductivity meters for chemical analysis will be exhibited.

International Nickel Co., 67 Wall St., New York, N. Y.—The exhibit will include a variety of nickel and nickel alloys.



The Simpson mixer, made by National Engineering Co., is adaptable to such operations as chocolate milling and batch mixing.

Henry E. Jacoby, 205 East 42nd St., New York, N. Y.—Sperry Co.'s filter presses; the Zaremba Co.'s evaporators, special process equipment manufactured by Artisan Metal Products, Inc.; and full view sight glasses and fittings will be included in the exhibit.

Jeffrey Mfg. Co., Columbus, Ohio—A small scale model of the Jeffrey-Traylor Waytrol continuous feeding, weighting, batching and proportioning unit with gravimetric control will be shown.

Kewannee Mfg. Co., Adrian, Mich.—The exhibit will include laboratory tables, hoods, sinks and troughs, as well as a display of Kemrock, a new material for laboratory surfaces and capable of withstanding heat, acid, alkalies and other materials.

Kimble Glass Co., Vineland, N. J.—The exhibit will consist of a display of laboratory glassware for research, control and analytical work.

Kinney Mfg. Co., 3529 Washington St., Boston, Mass.—Liquid and vacuum pumps,

power transmission equipment, and vacuum type valves will be shown, including CVD compound vacuum pump for vacuums up to 0.0005-mm. absolute pressure.

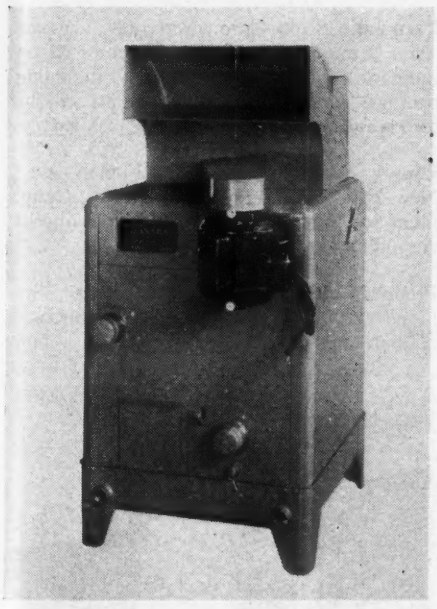
Maurice A. Knight, Akron, Ohio—Chemical stoneware equipment such as tank linings, tower packings and fume scrubbers will be shown.

L. O. Koven & Brother, Inc., 154 Ogden Ave., Jersey City, N. J.—A pictorial display of built to order processing equipment such as tanks, kettles, mixers and digesters will be featured.

Kron Co., 1720 Fairfield Ave., Bridgeport, Conn.—Weighing scales will be shown by this company.

Laboratory Furniture Co., 37-18 Northern Blvd., Long Island City, N. Y.—Equipment for chemical laboratories will be on exhibition.

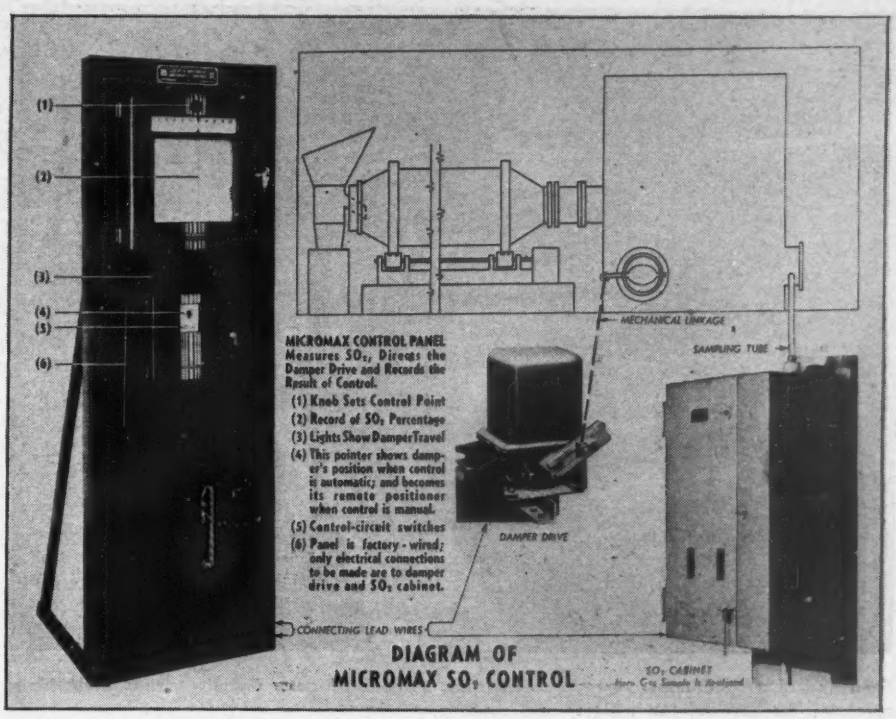
LaBour Co., Elkhart, Ind.—Centrifugal pumping equipment of self-priming and gravity feed type will be shown. Also included in the exhibit will be a new high efficiency porcelain pump with a metal impeller, together with a line of porcelain pipe and fittings, valves and strainers, and a line of improved self-priming centrifugal pumps known as DPLT.



The Niagara "Aero" heat exchanger is used in the cooling of liquids or gases.

Lancaster Iron Works, Inc., Lancaster, Pa.—Two laboratory-size mixers fitted with dust-inclosed mixing pans and a scale model of the large-production size mixer also with a dust-inclosure as well as a separately driven elevator hopper loading mechanism will be exhibited.

Lapp Insulator Co., LeRoy, N. Y.—Porcelain process equipment such as valves, pipes and fittings together with several new valves of the quick-opening, safety and flush bottom-outlet type for tanks will be exhibited. A new support for Raschig ring tower packing will also be shown.


(1)
(2)
(3)
(4)
(5)
(6)
MECHANICAL LINKAGE
SAMPLING TUBE
MICROMAX CONTROL PANEL
Measures SO_2; Directs the Damper Drive and Records the Result of Control.
(1) Knob Sets Control Point
(2) Record of SO_2 Percentage
(3) Lights Show Damper Travel
(4) This pointer shows damper's position when control is automatic; and becomes its remote positioner when control is manual.
(5) Control-circuit switches
(6) Panel is factory-wired; only electrical connections to be made are to damper drive and SO_2 cabinet.
DAMPER DRIVE
CONNECTING LEAD WIRES
DIAGRAM OF
MICROMAX SO_2 CONTROL
SO_2 CABINET

"Micromax" SO_2 control made by Leeds & Northrup, should prove useful to food plants that preserve fruit pulps with sulphurous acid.

Leeds & Northrup Co., 4986 Stenton Ave., Philadelphia, Pa.—A variety of process control equipment will be shown including instruments for the control of sulphur dioxide production from sulphur burners and for the control of pH.

Louisville Drying Machinery Co., 451 Baxter Ave., Louisville, Ky.—Included in the exhibit of dewatering and drying equipment of various types will be a new rotary distributor to be used on rotary dryers. The distributor permits carrying a larger volume of material in the dryer cylinder.

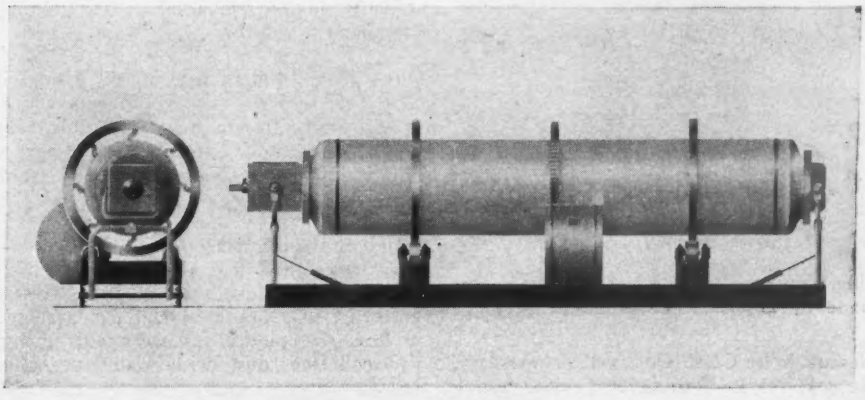
Lukens Steel Co., Coatesville, Pa.—This company uses two colored motion pictures as a medium for exhibiting clad steels—nickel, monel and Inconel—their manufacture and applications in the processing industries.

Marlo Co., 434 Broadway New York, N. Y.—Mechanical packing of various types, featuring a special packing for butadiene pumps, will be on exhibition.

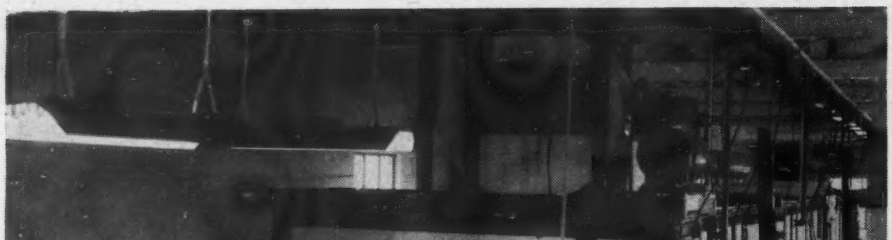
Merco Nordstrom Valve Co., 400 Lexington Ave., Pittsburgh, Pa.—A complete line of lubricated plug valves will be shown, featuring alloy valves and Merchrome coated, hard-faced valves, and including the new Nordstrom valves with extended shanks for extremely hot or cold services.

Metal-Glass Products Co., Belding, Mich.—Stainless steel equipment such as tanks, pumps and sanitary fittings and a standardized line of storage and processing equipment will be shown.

Mine Safety Appliances Co., Braddock, Thomas & Meade Sts., Pittsburgh, Pa.—Safety equipment such as gas detecting and analyzing instruments, respiratory protective equipment, first aid cabinets, bulletin display cabinets and supplies will be shown. Also included in the exhibit will be the new Fend line of protective hand creams and lotions to protect against industrial dermatitis, a line of cellulose acetate face shields, and the new Foille spray kit for emergency treatment of burns.



Rotary dryer of glass-lined construction, made by Pfaudler Co., is a laboratory model measuring 10 ft. overall, and can be used for drying various foods and for continuous crystallization.

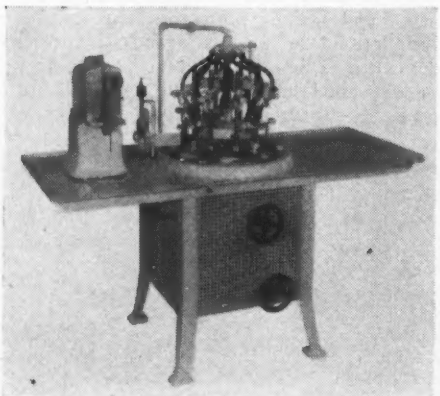


Feed end of a continuous conveyor dehydrator made by Proctor & Schwartz, Inc., showing spreader mechanism, fan motors, and controls.

Mixing Equipment Co., 1024 Garson Ave., Rochester, N. Y.—Industrial mixers and agitators will be on exhibition as well as a newly designed line of air-driven mixers for use in explosive atmospheres and a new high-efficiency gas disperser.

Nash Engineering Co., South Norwalk, Conn.—Included in the exhibit will be compressors, Pyrex glass centrifugal pumps in operation, and non-pulsating vacuum pumps.

National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.—Mixing machinery, including a demonstration of the laboratory size of Simpson "Intensive" mixer showing the mulling principle of mixing will be shown, and as a new feature, an exhibition of the cycle-timed system of mixer control with push-button reset.



Filling and sealing machines for ampoules, made by Popper & Klein, Inc.

Newark Wire Cloth Co., 351 Verona Ave., Newark, N. J.—Wire screen cloth, testing sieves and sieve shakers will be exhibited.

New England Tank & Tower Co., Everett, Mass.—Storage and mixing tanks will be shown.

Reeves Pulley Co. reducer-type transmission equipped with adjustable motor base, to accommodate any standard constant speed motor for individual drive.

Niagara Blower Co., 6 E. 45th St., New York, N. Y.—This exhibit will include the "No Frost" cooling units, the "Aero" heat exchanger units, and also air conditioning equipment.

Oliver United Filters, Inc., 33 W. 42nd St., New York, N. Y.—The exhibit will consist of Olivite corrosion resistant centrifugal pumps and a new model of O-D-S diaphragm pump for handling pulps and slurries.

Pangborn Corp., Hagerstown, Md.—Industrial dust control and blast cleaning equipment will be on exhibition as well as a new industrial type unit dust collector available in three sizes, and a dust wetter for mixing dry collected dust with water or other liquids.

Parker Appliance Co., 17325 Euclid Ave., Cleveland, Ohio—A complete line of tube couplings, valves and tube fabrication, including plastic tubing will be shown.

Pfaudler Co., Rochester, N. Y.—Glass-lined and stainless steel processing equipment will be shown. Including in the exhibit will be a new rotary glass-lined dryer of laboratory size; a new unit of a standard line of stainless steel reaction kettles available in sizes from 5 to 500 gal.; glass-lined steel flush valves and safety valves; a glass-lined sight box; high pressure glass-lined pipe; glass-lined steel heat exchangers; and a 500-gal. high pressure glass-lined reactor together with a 100-gal. pilot plant kettle and an improved laboratory auto-clave for 500 lb. internal pressure.

Photovolt Corp., 95 Madison Ave., New York, N. Y.—Instruments of various types will be on exhibition, including a new photoelectric smoke meter and an electronic timer, new models of photoelectric colorimeters and a new photoelectric vitamin A meter.

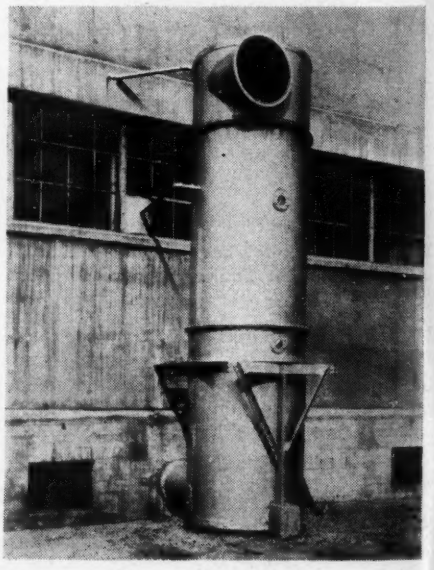
Pioneer Rubber Co., Willard, Ohio—Neoprene and Neoprene-impregnated protective clothing such as gloves and aprons will be shown.

Pittsburgh-Equitable Meter Co., 400 Lexington Ave., Pittsburgh, Pa.—Meters for measuring air, gas, oil, water and other commodities will be on exhibition.

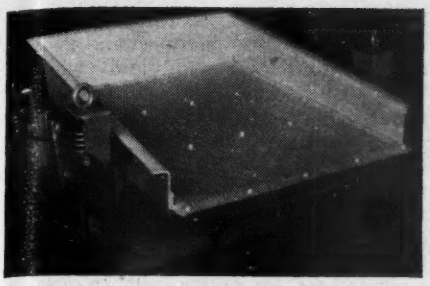
Pneumatic Scale Corp., Ltd., 68 Newport Ave., Quincy, Mass.—Packages produced on standard packaging machinery including packages for Army and Lend-Lease will be on exhibition.

Popper & Klein, Inc., 300 Fourth Ave., New York, N. Y.—Automatic electric equipment for the washing, filling and sealing of ampoules will be shown.

Premier Mills Corp., 214 Genesee St., Geneva, N. Y.—This exhibit will include colloid mills and mixers as well as a new



One of a number of dust collectors made by Claude B. Schneible Co., and installed at the plant of a large manufacturer of corn products.



Screening feeder made by Syntron Co., of type used for separating out fines in such operations as packing of dehydrated vegetables.

laboratory mill having interchangeable surfaces.

Proctor & Schwartz, Inc., 7th St. & Tabor Rd., Philadelphia, Pa.—A photographic display of the part Proctor & Schwartz dryers are playing in the drying of foods and chemicals, with pictures of a range of dryers and of the new continuous food dehydraters, with samples, will be shown.

Productive Equipment Corp., 2026 W. Lake St., Chicago, Ill.—Vibrating screen equipment, including a special unit for dewatering with clear plastic covers to show operation and lubrication will be shown. A vibrating screen with a vibrating conveyor will also be on exhibition.

Pulverizing Machinery Co., Chatham Road, Summit, N. J.—High speed fine pulverizing equipment will be on exhibition in four sizes, the "Bantam" and models No. 1 SH, No. 2 DH, and No. 3 TH.

Raymond Pulverizer Division, Combustion Engineering Corp., 1315 N. Branch St., Chicago, Ill.—Hammer mills and other grinding machinery and size-control equipment will be shown.

Reeves Pulley Co. of N. Y., Inc., 76 Dey St., New York, N. Y.—Variable speed power transmission equipment will be shown. A newly developed variable speed transmission with built-in reducer will also be exhibited.

Republic Filters, Inc., 480 Lexington Ave., New York, N. Y.—Several newly developed types of filters for use on naval vessels, for filtering explosives and other uses will be exhibited, in addition to models of standard filters.

Richmond Mfg. Co., Lockport, N. Y.—Laboratory and production size gyratory sifters and Permaflux-Alnico magnets will be on display.

Ritter Products Corp., Ritter Park, Rochester, N. Y.—Electrostatic separators and a new dry classifier which accomplishes dry sizing without the use of screen cloth will be shown.

John A. Roebling's Sons Co., Trenton 2, N. J.—Wire cloth, screens, metallic filter cloth and other wire products will be featured by this company.

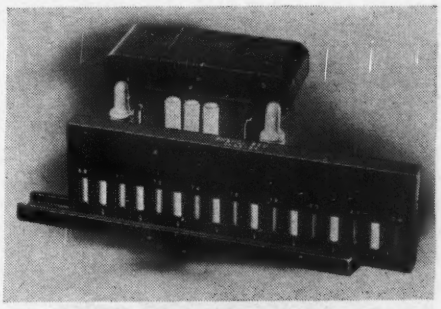
Milton Roy Pumps, 1300 E. Mermaid Ave., Philadelphia, Pa.—Step-valve pumps of various standard types, including a pump with transparent plastic valves and ground glass checks for dilute acids will be on exhibition. Included in the exhibit will be a proportioning pump with a new electronic volume control and a high pressure triplex metering pump which minimizes pulsations and handles a greater volume per unit of power consumption at a given pressure.

Claude B. Schneible Co., 2827 25th St., Detroit 16, Mich.—On exhibition will be a standard "Multi-Wash" dust collector with a glass shell to permit a view of the equipment in operation as well as a new unit type "Multi-Wash" collector which combines the collector tower, fan motor, liquid recirculating tank and pump.

Scientific Equipment Co., 220 E. 42nd St., New York, N. Y.—Laboratory equipment and instruments will be shown.

Scientific Glass Apparatus Co., 49 Ackerman St., Bloomfield, N. J.—This company will exhibit laboratory glassware.

Seederer-Kohlbush, Inc., 27-29 S. Van Brunt St., Englewood, N. J.—Laboratory balances will be shown.



Slide comparator for general pH control work, made by W. A. Taylor & Co., is made of molded plastic.

Selas Co., Erie Ave. & D. St., Philadelphia, Pa.—Controlled pore-size porcelain filter media such as filter crucibles, special filter shapes and bacteriological filters will be on exhibition. Also shown will be surface and interfacial tension separators for the continuous separation of immiscible liquids, and a compressed air filter ejector for continuous ejection of moisture from compressed air lines.

Separations Engineering Corp., 110 E. 42nd St., New York, N. Y.—An Air Table, "Avalanche" separator and "Electro-Float" electrostatic separator, and other separation equipment manufactured by Sutton, Steele & Steele of Dallas, Tex., will be on exhibition. The Air Table is used for cleaning grain, seeds, nuts, and for removing infestations.

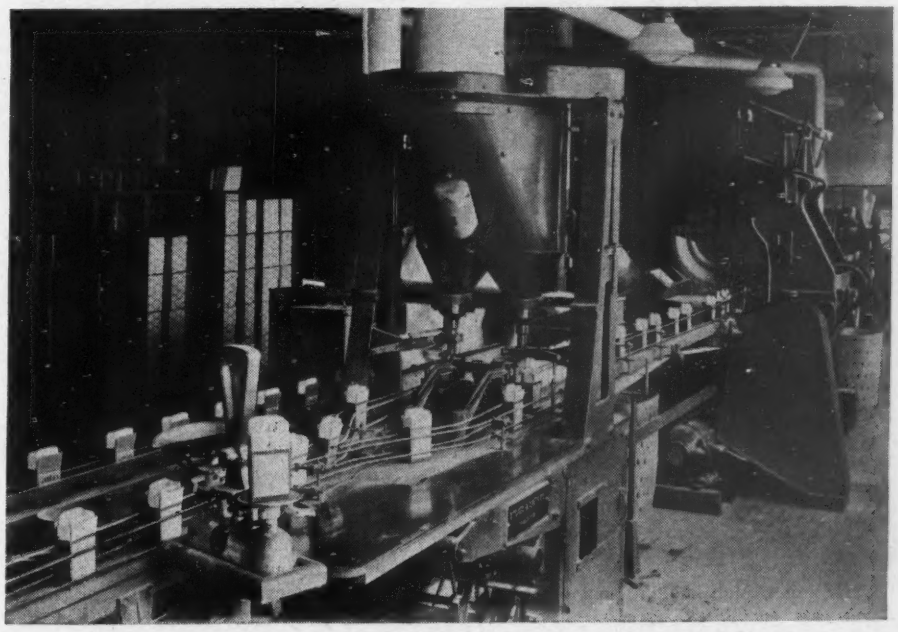
Sharples Corp., 23rd & Westmoreland Sts., Philadelphia, Pa.—Drawings and photographs of several types of centrifugal separation equipment such as the self-discharging types, the continuous discharge bowl machines and the standard high-speed Supercentrifuge will be shown.

T. Shriver & Co., 808 Hamilton St., Harrison, N. J.—Pictures of filter presses, continuous thickeners, diaphragm pumps and wax molding presses will be displayed. The enclosed pressure filter for clarification, which is leak-proof and vapor-proof is a new development, also new is a laboratory oxygen-hydrogen generator.

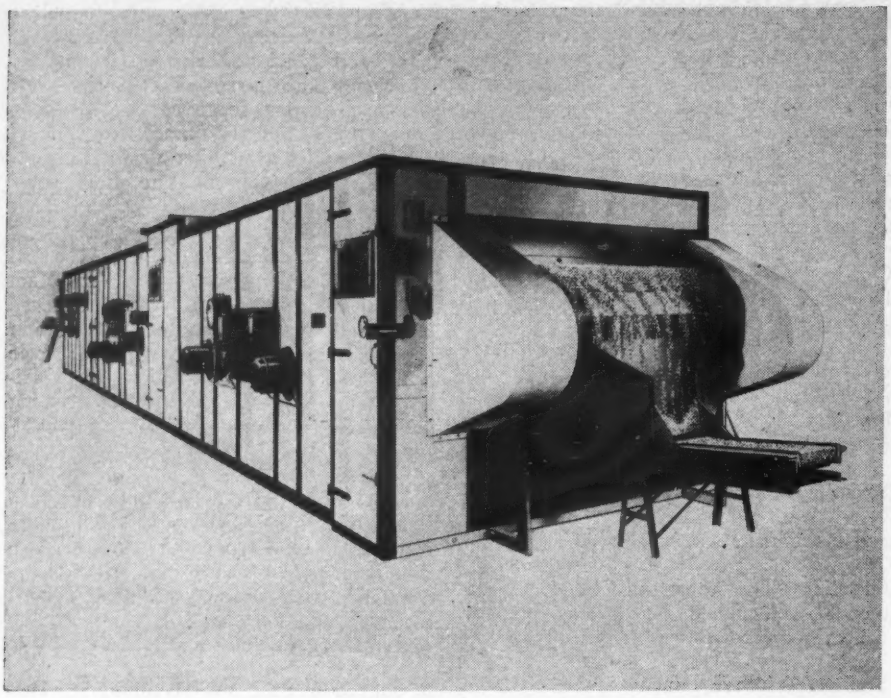
Sivyer Steel Casting Co., 1675 S. 43rd. St., Milwaukee, Wis.—A variety of stainless steel applications, including valve trim and bodies, pipe fittings and other parts, will be shown.

Sparkler Mfg. Co., Mundelein, Ill.—A transparent laboratory filter, Model 8-3, in operation and several types of pressure filters will be on exhibition.

F. J. Stokes Machine Co., Olney P. O., Philadelphia, Pa.—Molded plastic parts,



Syntron vibrator installed on the feed hopper of a Stokes and Smith packaging machine.

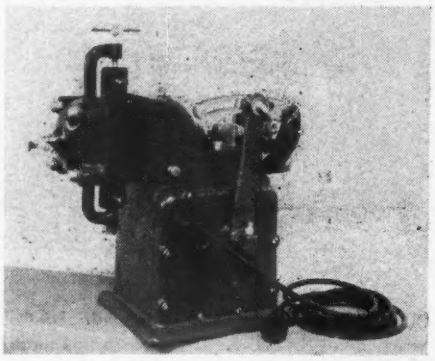


Discharge end of continuous dehydrater manufactured by Proctor & Schwartz

dehydrated biological products and photographs of recent developments in commercial uses of high vacuum will be on exhibition. A new line of high vacuum pumps for use in the low micron range, a McLeod type high vacuum gage and a new high-capacity mechanical press will be shown.

Swenson Evaporator Co., Division of Whiting Corp., Harvey, Ill.—Photographs and drawings of equipment for process industries, such as evaporators, vacuum crystallizers, and spray drying equipment for food and chemicals will be displayed by this company.

Syntron Co., Homer City, Pa.—Vibrating equipment such as vibratory feeders, bin and hopper vibrators, hydraulic jolters, electric vibrating packers and "Vibra-Flow" dry feeder machines will be on exhibition.



The Wallace & Tiernan feeder is used where it is desired to add a small amount of some material continuously to a flowing product.

Transferring high melting point fats from drums is facilitated by use of a "Chromalox" electric immersion heater, made by Edwin L. Wiegand Co.

W. A. Taylor Co., 7300 York Road, Baltimore, Md.—Included in this exhibit will be pH and chemical comparators for laboratory use and water testing, pH, and several types of slide comparators.

Toledo Scale Co., Toledo, Ohio—Industrial weighing and weight-printing scales are the equipment to be on exhibit by this company.

Tolhurst Centrifugal Division, American Machine & Metals, Inc., East Moline, Ill.—Centrifugal separation equipment will be shown.

Tri-Clover Machine Co., Kenosha, Wis.—Stainless steel and Trialloy equipment such as pumps, valves and fittings will be shown. The company has also developed a new method of manufacturing stainless steel tubular products.

U. S. Stoneware Co., 60 E. 42nd St., New York, N. Y.—Chemical stoneware products and acid-resisting cements, lead and lead-lined products, and a line of corrosion resisting plastics will be on exhibition. Several new products will also be shown. They are: Cerathrem 500, a chemical stoneware; a new cast lead valve with a replaceable and reversible valve seat; a boltless flexible coupling for chemical stoneware and asbestos-cement pipe known as Tylox; Reanite, a plastic bond for uniting metal to metal or to rubber; and new formulations of Tygon, a rubber-like plastic resistant to high octane fuels.

Walker-Wallace, Inc., 14 W. Utica St., Buffalo, N. Y.—A. P. V. plate type heat exchangers for use in food and chemical industries will be shown.

Wallace & Tiernan Products, Inc., Belleville, N. J.—Demonstrations of improvements in plant efficiency through chlorination of water supplies, including examples from various industrial plants, and chemical control equipment and industrial water treatments will be shown. Included in the exhibit will be a demonstration model of a typical control unit and operating model of the reagent solution feeder.

Edwin L. Wiegand Co., 7500 Thomas Blvd., Chicago, Ill.—Electric heating equipment will be featured by this exhibitor, including hot plates for packaging and immersion heaters.

Williams Patent Crusher & Pulverizer Co., 2701 N. Broadway, St. Louis, Mo.—This exhibit will include hammer mills and other reduction equipment.

Yale & Towne Mfg. Co., Philadelphia Division, 4530 Tacony St., Philadelphia, Pa.—Materials handling equipment, including electric hoists, spur-geared hoists, screw-geared hoists, and the "Pul-Lift" hoist will be shown. There will also be photographs of hand lift trucks, electric industrial trucks and hoisting equipment.

Heat-sealing in hand packaging operations is speeded by a thermostatically controlled electric hot plate, made by Edwin L. Wiegand Co.

What You Must Do To Get Food Plant Equipment

By W. B. SPOONER, JR., Spooner & Kriegel, Industrial Counsel, New York, N. Y.

Food manufacturers requiring equipment; maintenance, operating or repair supplies; or new construction are affected by many government orders and regulations. This article brings the situation up-to-date and gives the procedure to follow

The information in this article was correct as of mid-November. At that time the facts were checked with officials in Washington. There may be further revisions, however, in the orders governing the purchase of processing equipment, and readers should watch for such changes.—THE EDITORS.

THE food manufacturer, like any other producer today, is concerned with the problem of obtaining equipment; maintenance, repair and operating supplies; raw materials; and—to a considerable extent—construction materials and facilities to meet a valid need for expansion due to war requirements.

A rather large number of orders and regulations govern the ability of the food manufacturer to obtain these things. Practically, all these regulations apply directly not to the food producer, but to the firms who make the things he needs. Yet in a large proportion of the cases, it is the food manufacturer who has to take the initial steps to provide the ratings or the approvals which are essential for his suppliers before they can begin to work on any equipment or materials orders he may want to place.

This article attempts to cover the ground of existing regulations which affect the food manufacturer and to indicate the procedure advisable in connection with various types of equipment and materials. It is important to note that while the most recent available information has been incorporated in this article, changes in the situation due to new orders or amendments and interpretations of old orders may affect the picture at any time. However, in most cases these changes will not materially affect the procedure recommended for the food producer, since limitations in materials used, types of machinery permitted and practically all such controls exercised by the War Production Board are directed to the manufacturer of the equipment involved.

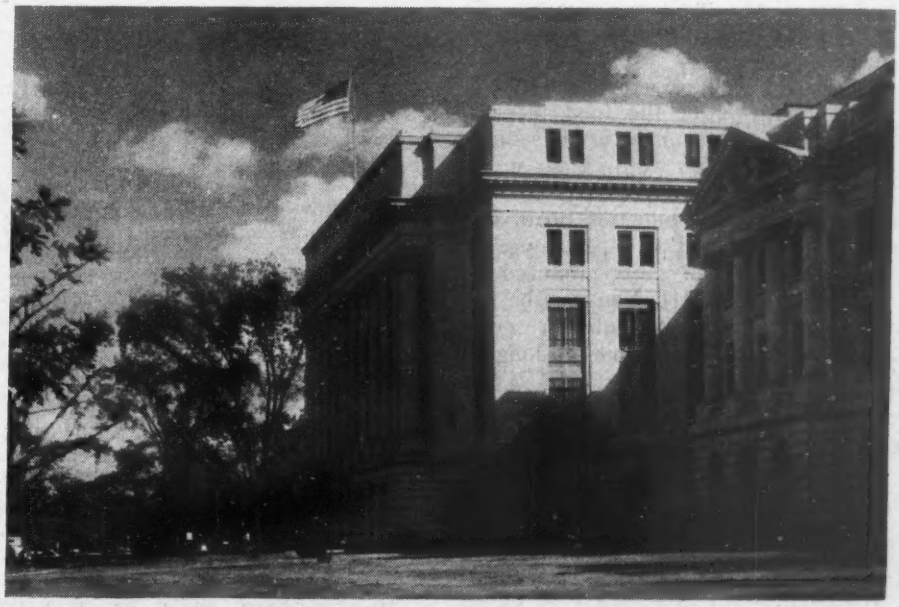
In order to approach this problem of definition and recommendation in an orderly fashion, we have broken down the major needs of the food manufacturer into four main divisions:

Processing equipment
General industrial equipment
Maintenance, repair and operating supplies
Construction

Before considering these subjects in turn, it is well to remember one important fact. Processing and general plant equipment, construction and maintenance, repair and operating supplies require metals—particularly iron and steel, most forms of which are controlled materials, because of their scarcity in war times. Those who make machinery and equipment using specified forms or shapes of steel (including wrought iron), copper, or aluminum operate under the Controlled Materials Plan. The amount of controlled materials allotted to them by various claimant agencies or Industry Division of the War Production Board is dependent on their requests for allotment of controlled materials which are in turn based both on their orders on hand and on their estimate of orders which will be received during the period for which they are asking for allotment. *If you wait until the last possible moment before making whatever priority applications you must make for anything requiring controlled materials, you are not only handicapping your supplier, but making the Controlled Materials Plan that much more difficult of operation.*

The "home" of the food industry is the War Food Administration. This division is a claimant agency with allotments of controlled materials at its disposal. This fact, however, does not practically affect your place in the picture, since the initiative in obtaining approvals of priorities or allotments for the things you need is up to you and your procedure is the same as that for any other industry dealing with other claimant agencies.

Your supplier, not having your order, with suitable rating and allocation symbol or end use (if required) must make



Headquarters of the War Food Administration, the administration building of the U. S. Department of Agriculture, where decisions are made regarding priorities for food processing machinery.

USDA Photo by Purdy

USDA Photo by Forsythe

USDA Photo by Purdy

Three officials who have the final say about the priority ratings for food plant equipment. They are (right) Marvin Jones, WFA administrator; John B. Hutson (left), associate administrator; and Roy F. Hendrickson, director of food distribution.

a guess as to what you and other probable customers are likely to need in a certain period. He must also guess as to ratings and end uses involved. His picture for the War Production Board is far from definite and when your orders and others like them do come in after he has been allotted his materials, their volume may and often does exceed the estimate he has made. This means requests for additional materials, delays, and complications which can be avoided to a large extent if you will plan your needs well in advance, make your applications for priorities and allotments and issue your orders as early as you possibly can. Incidentally, your place in the delivery line will not suffer and you stand a much better chance of getting needed equipment when it is needed.

It is also well to remember that a large proportion of the food processing equipment you may need is on a quota basis. In other words, many specified items can be produced in a volume fixed by the War Production Board and in general are based on a percentage of average number of units produced in 1939, 1940 and 1941. You may be too late to get into that quota for something you need if you wait too long.

Processing Equipment

The ability of an equipment manufacturer to supply you with wanted processing machinery is governed by both Limitation and Conservation Orders of the War Production Board. You should know enough of the scope of these orders to enable you to supply the kind of data put on your application form which will best place your needs before the Board in view of the limitations imposed. The governing Limitation or Conservation Orders will first be outlined, followed by definite recommendations as to the War Production Board Forms most suitable for your use.

Limitation Order L-292—This Order is the most important order now existing regarding food processing machinery. It prohibits the delivery of certain specified food processing machinery on and after June 30, 1943, unless the order for such a piece of equipment is an "approved" order. It prohibits acceptance of orders on and after June 15, unless they are "approved."

1. An "approved" order is any order for any specified food processing machinery appearing on Schedule "A" below, bearing a preference rating of AA3 or higher assigned on WPB Form 617 (formerly PD-200).
2. It is also "approved" if it is for delivery of any of the canning machinery in Schedule "A" in the territorial limits of the U. S. and Canada and bears a rating of AA3 or higher assigned on WPB Form 576 (formerly PD-285). Similarly, orders for any of the specified dairy, egg or poultry processing machinery in the same area and bearing an AA3 or higher assigned on WPB Form 748 (formerly PD-414) are "approved."
3. An "approved" order is also one for any food processing machinery listed in Schedule "A" (*except* canning machinery or dairy, egg or poultry processing equipment) with an AA3 rating or higher assigned on WPB Form 541 (formerly Form PD-1A).
4. "Approved" also are orders for meat canning, meat packing and meat processing machinery of certain specified types to be delivered within the territorial limits of the U. S. and Canada bearing an AA3 rating or higher assigned on Form WPB 3155.

SCHEDULE "A"

Specified Food Machinery Sellable on "Approved" Orders

Baking machinery and equipment	Food slicing and meat grinding machinery and equipment (1 hp. and over)[4]
Brewing machinery and equipment [1]	Macaroni processing machinery and equipment
Canning machinery and equipment [2]	Meat canning, packing and processing machinery and equipment [5]
Coconut shredding and processing equipment	Nonalcoholic beverage manufacturing machinery and equipment [1]
Coffee, tea, cocoa and spice grinding and processing equipment (1 hp. and over)	Sugar processing machinery and equipment
Confectionery machinery and equipment	Tobacco processing machinery and equipment
Dairy, egg and poultry processing machinery and equipment [3]	Seed cleaning equipment
Flour, grain, feed milling and processing machinery and equipment	

[1]All kinds, including bottling, bottle capping and labeling, but *excluding* refrigeration machinery and equipment.

[2]All kinds used for canning, dehydrating, freezing and fresh packing of fruits, vegetables, fishery products (and byproducts) and all other human and animal food (including all preparation machinery and equipment, filling, labeling and casing machinery, and change parts for different can or container sizes). *Excluding:* Preparation equipment for meat and meat products; home canning and dehydrating equipment; container sealing, closing and jar capping machines; refrigerating equipment and steam jacketed kettles, regardless of use, designed to use steam at working pressures of less than 90 lb. per square inch.

[3]All machinery and equipment used in commercial processing of these products, including bottling, bottle capping and labeling, but *excluding* machinery or equipment used on a farm for the production and handling of milk, eggs or poultry prior to delivery to a processor. Also other farm equipment covered by Limitation Order L-257.

[4]Including power driven saws, but *excluding* slicing and grinding equipment designed as canning machinery.

[5]All kinds, including filling, labeling and casing, but *excluding* container sealing and closing and jar capping machines; refrigeration equipment and home canning equipment.

The food machinery covered in this list includes all new equipment with a sale value of $50 or more for any single unit or $300 for any single used, rebuilt or reconditioned unit. Specifically excluded from this list, because of other Limitation Orders covering them, are:

Refrigerating machinery and equipment as defined in L-38	Packaging, labeling and filling machinery except as specifically noted in the above list
Farm machinery and equipment	

Scales and balances as defined in L–190
Conveying machinery as defined in L–193
Oil processing machinery and equipment for vegetable, animal and fish oils, fats, greases

An order will be issued to cover oil processing machinery and equipment.

The other L orders noted above will be discussed under the head of General Industrial Equipment.

Obviously, packaging, labeling and filling machinery not specifically noted above cannot get "approved" orders.

With these exceptions and those covered in notes to the list above, you can apply for approval on certain forms and get an "approved" order with a rating of AA3 or higher for most food processing machinery, assuming that your need is important enough in view of the war situation. Under the subject of "Forms to Use," the importance of putting your case effectively is discussed.

This prohibition of L-292 applies to new machinery for use in addition to existing equipment. You can order food processing machinery and equipment under CMP Regulation No. 5 if they are for *replacement* of an existing piece of machinery and if the individual unit does not cost over $250. Minor capital additions may, in some instances, be obtained through the use of procedures outlined in CMP Regulation No. 5. If the items concerned are not covered by Order L-292, and the acquisition of them is not limited by some other order or regulation of WPB, the MRO procedure may be used to obtain minor capital additions which do not cost more than $500 (excluding the purchasers cost of labor). Details on CMP Regulation No. 5 will be found in the discussion of Maintenance, Repair and Operating Supplies. The certification required is also covered there.

Limitation Order L-292 also prohibits with exceptions noted below the manufacture of any new food products machinery in Schedule B, regardless of the sales value of the items. Parts may be manufactured only for use in reconditioning or rebuilding of used machinery and for maintenance (upkeep of machinery in sound working condition) or repair (restoration without change of design of any portion of the machinery) to sound working condition when such portion has been rendered inoperative, unsafe or unfit for service by wear and tear, damage or destruction or failure of parts or other similar cases.

Any machine or piece of equipment for which parts weighing in the aggregate not less than 75 percent of the weight of the finished machine were fabricated *prior to June 5, 1943*, and which parts cannot be used as maintenance or repair parts for other food machinery or for the assembly of food machinery not on this prohibited list can be completed. However, at this late date, this proviso is of academic interest in most cases.

SCHEDULE "B"
Food Machinery Prohibited by Order L-292 Except Under WPB Schedules

1. The following items of baking machinery and equipment:
   a. Angel food panwashing machine
   b. Cake slicing machine
   c. Dough brakes
   d. Dough hopper (individual unit)
   e. Doughnut machines
   f. Vibrating screens
   g. Filling machines
   h. Fruit cleaning machines
   i. Icing machines
   j. Oven and conveyor dump units excluding dump racks
   k. Pan greasers
   l. Pan washing machines
   m. Pie pan washing machines
   n. Retarding dough box
   o. Sack cleaners
   p. Sweet and plain roll tables
   q. Sweet roll cutting machines
   r. Trolleys
   s. Trough dividing boards
   t. Chocolate melting kettles
   u. Dough sheeting and stamping machines
   v. Enrobers
   w. Icing trolleys
   x. Marshmallow depositors
   y. Oil spraying machines
   z. Sandwich machines
   aa. Spreading machines
   bb. Sugar topping machines
   cc Sugar wafer machines
2. All brewing machinery and equipment including bottling machinery and equipment but excluding refrigeration machinery and equipment
3. All coconut shredding and processing equipment
4. Coffee, tea, cocoa, and spice grinding and processing equipment except equipment by and for the direct use of the Army, Navy, Maritime Commission and War Shipping Administration, and except equipment used in the manufacture of soluble and dehydrated coffee
5. All confectionery machinery
6. The following items of dairy machinery and equipment:
   a. Automatic pasteurizing and holding controls for vat pasteurizers
   b. Batch measures
   c. Batch weighers
   d. Butter wrappers
   e. Butter cutters—power driven
   f. Fruit feeders
   g. Flavor tanks for ice cream mix
   h. Ice cream freezers, except on order by and for the direct use of the Army, Navy, Maritime Commission and War Shipping Administration
   i. Ice cream cup-package fillers
   Coating and dipping machines, all types
   Bar and popsicle machinery
   j. Ice cream cutting and wrapping machines
   k. Homogenizers for whole fluid milk
   l. Milk bottle hooding machines
   m. Milk irradiators
   n. Milk bottle case washers
   o. Paper bottle filling machines
   p. Soft curd machinery
   q. Vacuum milk samplers
   r. (Revoked Sept. 6, 1943)
   s. Foam destroyers
   t. Multiple effect vacuum pans
   u. Automatic pocket type holding systems
   v. Milk can washers for handling chained type covers
   w. All sanitary fittings for dairy machinery and equipment except the following, as set forth in the International Association of Milk Dealers Code:
   No. 2C ell
   No. 2F ell, one end threaded
   No. 6 tee, one end recessed
   No. 7 tee
   No. 9 cross
   No. 10C valve
   No. 11C valve, 3-way
   No. 13H union nut
   No. 14 union ferrule
   No. 14A union ferrule
   No. 14R union ferrule, recessless
   No. 15 union ferrule, threaded
   No. 15R union ferrule, threaded, recessless
   No. 16A cap
   No. 17 coupling
   No. 20 pipe clamp, tapped ¾ in. I. P. T.
   No. 21 nipple adapter
   No. 22 coupling adapter
   No. 23A thermometer ferrule, fine thread
   No. 23B thermometer ferrule
   No. 24 pipe hanger clamp ⅜ in I. P. T.
   No. 25H malleable wrench
   No. 26D ell 45 degrees
   No. 31R reducing ferrule, concentric
   No. 32 eccentric reducing ferrule
   No. 32–15 reducing ferrule, eccentic, small end
   No. 32R eccentric reducing ferrule, flat face
   No. 33B can filler
   No. 38 vat outlet
   No. 43 tank outlet
   No. 45H check valve, hexagon nut
   No. 45V check valve
   No. 30W angle valve, inlet recessed
   No. 30WC angle valve 90 degree
   No. 60T compression valve, tee
   No. 60C compression valve, cross
   No. 60Y compression valve, straightway
   No. 60R compression valve, recessless
   No. 135H union nut
7. The following items of egg machinery and equipment:
   a. Egg graders, hand
   b. Egg graders, power
8. The following items of flour and grain milling machinery:
   a. Mixers (molasses, etc.)
   b. Pellet machines
9. Food slicing and meat grinding machinery and equipment except:
   a. Preparation machinery for canning and dehydrating
   b. Freezing equipment
   c. Machinery and equipment used in commercial meat packing houses
   d. On order by and for the direct use of the Army, Navy, Maritime Commission, and War Shipping Administration
   e. Bread slicing machinery
10. All macaroni processing machinery and equipment except drier
11. Nonalcoholic beverage manufacturing machinery including bottling machinery and equipment but excluding refrigeration equipment and excluding fresh fruit and vegetable juice machinery
12. The following items of poultry machinery and equipment:
   a. Blood cups
   b. Poultry killing machines
   c. Waxers, poultry
   d. Wax extractors, poultry
13. Sugar processing machinery and equipment
14. All tobacco processing machinery and equipment

All items on this list (list "B") may be produced only in accordance with a quota system explained below. You will note that a number of items appear on list "B" (equipment that may be made according to quota) and also on list "A" (equipment that may be sold on approved orders). This means that sales on approved orders may be made from warehouse stock whether manufacture is permitted or not.

Food processing machinery and equipment which appear on list "B" are under such strict War Production Board control that no manufacturer of such machinery is allowed to fabricate or assemble more units than a quota set by the War Production Board. The quota schedule for dairy machinery was issued September 7 and for canning machinery October 16. As of November 15, schedules for the production of egg and poultry machinery, bakery equipment, cereal, grain and flour milling machinery, and meat packing house machinery were in preparation and will be issued in the near future. Until these schedules are issued, production quotas are set at 50 percent of the average number of units produced in the three years, 1939, 1940 and 1941. Note that the quota for meat processing machinery is on a gross tonnage basis while other machinery is scheduled on a unit basis.

Limitation Order L-292 also contains a series of simplification schedules for dairy, egg processing and poultry processing machinery and equipment which are too complicated to reproduce in this limited space. This simplification primarily concerns the manufacturer of equipment, but if you, as a producer of a dairy, egg or poultry product, are told that a unit you want cannot be supplied because of the limitations imposed by these simplification tables, you will understand why and do what you can to fit the equipment offered as most closely approaching your needs to the job.

The order also contains a series of conservation provisions listing the permitted metals and alloys which can be used in designated parts of various food processing equipment. These provisions are too long to quote here, but again you will understand any proposals made by equipment manufacturers for substitution of nonprohibited metals where your specifications call for prohibited ones.

L-292 has so far two specific quota

schedules for the year beginning Oct. 1, 1943. These cover canning and dairy machinery and equipment and specifically list the quotas which may be manufactured expressed in terms of percentage of a base production volume which is the average number of units of the type concerned produced per year over the period 1939 to 1941 inclusive. These percentages vary considerably, from such figures as 50 percent for heating and preheating coils or vacuum type fillers to as high as 2,800 percent for fruit and vegetable bunchers. It is suggested that if you are interested in a detailed study of Order L-292, you ask your local War Production Board Office for copies of the original order and all amendments which have been issued to date.

Orders for food processing machinery to be used directly by the military or for export outside of territorial United States or Canada are not included in the manufacturer's quotas.

Forms To Use in Applying for "Approved" Orders—If you need equipment included in the list of machinery in Schedule "A", there are certain forms you can use to state your need, its importance in the war effort, and to ask for approval of your order. Even if the machinery you want appears on the prohibited list of Schedule B, you can still use these forms to ask for approval. If approval is secured for items on Schedule B, then the manufacturer, not the processor, files an appeal for exemption from the prohibition of Schedule B.

Each such form indicates clearly at its top to what WPB Division it should be mailed. Note, however, that form WPB 541 (formerly PD-1A) is always to be sent to your local WPB Office.

WPB Form 617 (formerly PD-200) is used and only used when the machinery is a part of a new processing plant.

Form WPB 541 (formerly PD-1A) must be used for all machinery except canning, dairy, egg or poultry and meat packing house equipment, when the purchaser is not a processor, i.e., when he is not processing for sale but for use, as a hospital, penitentiary, etc.

WPB Form 3155 should be used for meat canning, packing and processing machinery for commercial use.

However, there are two existing preference rating orders, P-115 and P-118, covering canning or processing of fruits, vegetables or fish, and dairy and egg processing respectively, which assign an AA3 rating to deliveries of materials for more efficient plant operation. Processors in these two branches of the food field should use the corresponding WPB application forms No. 576 and No. 748, which are directly considered by the War Food Administration.

In filling out any of these forms, remember that they are your evidence that what you are asking for is important in the war effort, either to further war activities directly or to safeguard civilian health and morale by insuring supplies of needed foods. State your case thoroughly and effectively and do not assume that the War Production Board knows all about your importance in the picture.

Appeals—On any case where the application of limitation or conservation orders seems to you to work undue hardship or where application has been made and your request for approval rejected, you are entitled to appeal to the War Production Board, setting forth the pertinent facts and the reasons why you are entitled to relief.

There is now no director general for operations in WPB. Under Priorities Regulation 16, issued Oct. 7, 1943, all appeals are made to the nearest regional WPB office. These offices have power to deny appeals but not to grant them. If not denied, they forward appeals to the Division (Washington) with recommendations.

Conservation Orders Affecting Food Plant Processing Equipment—There are a number of "M" or Conservation Orders which prohibit the use of specified metals or alloys in certain food equipment. They do not concern you as a food manufacturer except indirectly. The manufacturer of machinery is, of course, directly concerned. These M orders include: M-1-i, covering aluminum; M-6-b, covering nickel; M-9-c, covering copper, and copper base alloys; M-21-g, covering stainless steel; M-43, covering tin, and M-126, covering iron and steel. However, there are no major conflicts between these Conservation Orders and the Limitation Orders covering the food field. In other words, the conservation phases of L-292 have been planned to include the effects desired in the M orders covering affected metals. Hence both the food producer and the manufacturer of food equipment can, in general, follow the prohibitions outlined in this limitation order without worrying about the M orders which would otherwise affect them.

Harris & Ewing

Charles E. Wilson, who left the presidency of General Electric Co. to become vice-chairman of WPB, has in recent months taken over much of the responsibility in WPB for establishing priorities and allocating materials.

Tobacco processing machinery is covered by L-292, and appears on Schedule B, the list of machinery which may not be manufactured. It is also governed by M-126, iron and steel conservation. For permission to manufacture tobacco processing machinery an appeal must be filed with WPB under both orders and approved.

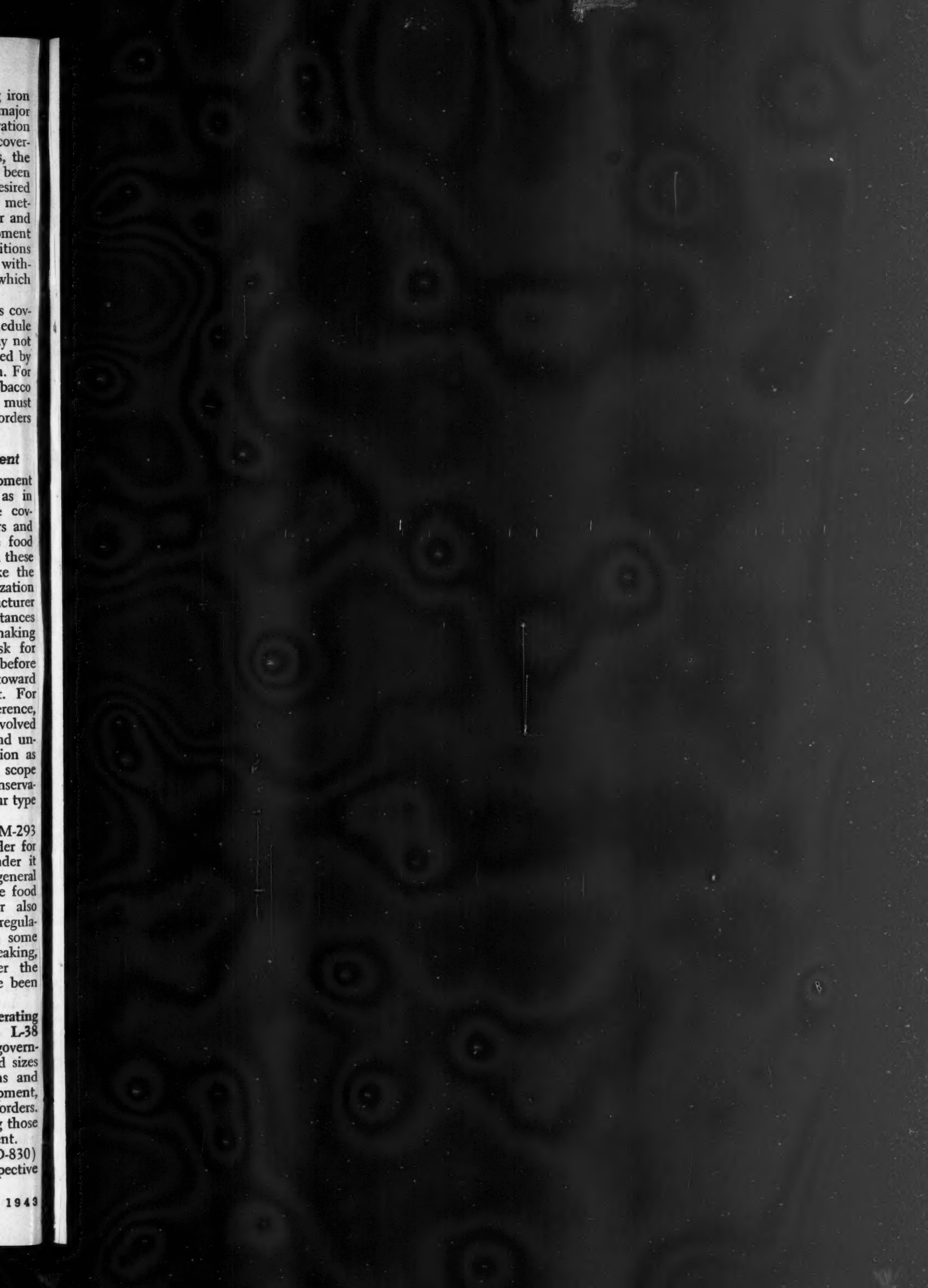
General Industrial Equipment

The many other kinds of equipment needed in food plants as well as in most other industrial plants are covered by various Limitation Orders and a few Conservation Orders. The food manufacturer is again interested in these orders only because he must take the initial step in applying for authorization to enable the equipment manufacturer to supply him, though in many instances a new note is introduced by making it obligatory for the user to ask for authority to buy certain items before any effective steps can be taken toward either ordering or producing it. For the sake of brevity and ready reference, the various types of equipment involved are listed in alphabetical order and under each head as brief a discussion as possible is given to indicate the scope and nature of limitation and conservation orders governing the particular type of equipment.

A recent amendment to Order M-293 makes it the basic scheduling order for critical components classified under it which include many items of general industrial equipment used by the food processor. This particular order also supersedes other orders and regulations which formerly applied to some of the products. Generally speaking, procedures which applied under the order superseded by M-293 have been retained.

Air Conditioning and Refrigerating Equipment (Limitation Orders L-38 and L-126)—Order L-38 is the governing one, and states the types and sizes of both air conditioning systems and parts, and refrigerating equipment, which may be sold on authorized orders. The food industry is listed among those that are entitled to this equipment.

WPB Form 2449 (formerly PD-830) must be filled out by the prospective



purchaser of parts or systems to obtain authorization to buy. A number of M, or Conservation Orders are involved, but there is no conflict with L orders. L-126 simply provides required specifications for various parts of the refrigeration phase of air conditioning equipment and is of interest to manufacturers of equipment primarily.

Compressors (Limitation Order L-100 and Conservation Order M-293)—Order L-100, which formerly governed the placement of orders for certain types of compressors by the food industry, and the acceptance of such orders by manufacturers of such compressors, has been superseded by General Scheduling Order M-293 with respect to new equipment. However, L-100 is being revised to apply to used equipment only, and will when this revision is completed govern the placement and acceptance of orders for used and reconditioned compressors.

Provisions of M-293, dealing with compressors, require that the user obtain authorization to purchase by filing form WPB 931 (formerly PD-415). Approval of the application becomes the processor's authority to buy and the manufacturer's right to accept the order. The approved form should accompany the purchase order. Application may also be made by filing form WPB 541 (formerly PD-1A) applying for a preference rating to purchase the equipment.

A preference rating of A-1-c or higher is required to purchase items of this classification. It is possible that rating requirements may be increased to AA-5 in the near future.

Compressors as used by the food industry for air conditioning, ice making, cooling, processing and preservation are not affected by either L-100 or M-293.

Conveying Equipment and Power Transmission (Limitation Orders L-193 and L-123. Order M-293) — Limitation Order L-123 (General Industrial Equipment) covers such equipment of the types used in the food industries as are not covered in Order L-193.

In general, Order L-193 does not allow the acceptance of any order for this type of equipment unless authorized, though for 90 days after Oct. 7, 1943, orders accepted prior to October 7 but after August 1 can be delivered, and as usual, equipment for the use of the Army, Navy, Maritime Commission or War Shipping Administration can be delivered in this period. A rating of AA-5 or higher is required.

Form WPB-1693 (formerly PD-681) is the form used to obtain authorization to be filled out by the user. It may be assumed that L-123, covering general industrial equipment and including such equipment as is not covered by L-193, is inoperative as far as the food field is concerned.

Harris & Ewing

As head of the War Production Board, Donald P. Nelson has to determine the relative importance of priorities for different types of industrial and war equipment.

Elevating Equipment (L-89 and L-123)—Under L-89, covering freight and passenger elevators, authorization to buy must be applied for by the ultimate user on WPB Form 1236 (PD-411). L-123, covering General Industrial Equipment, may be regarded as of no effect insofar as food plant requirements are concerned.

Fans and Blowers (L-280)—Unless an order for a fan or blower is rated AA-5 or higher, it cannot be accepted. Food plants requiring such equipment will use WPB Form 541 (formerly PD-1A) to apply for a priority rating. Note that this classification does not cover turbo-blowers, discussed below under another classification.

Instruments, Valves and Regulators (L-134 and L-272)—L-134 prohibits use of chromium or nickel and their alloys in instrument parts except for specified operating conditions. Details are too extensive to cover here, but application for rating on WPB Form 541 (PD-1A) should determine whether or not a food field application is allowable. L-272 permits establishment of simplification schedules as to sizes, forms, specifications, composition, etc., and is of direct interest to manufacturers of this equipment only.

M-293, covering critical common components applies in this case to control valves on purchase orders of $5,000 or more; to liquid level controllers on purchase orders of $5,000 or more and on combination purchase orders of these types totaling $5,000 or more. In such cases, application for authority to buy must be made by the user on WPB Form 1319 (PD-556). The manufacturer in such cases, reports unfilled orders, scheduled shipments, etc., monthly on Form PD-750.

Laboratory Equipment (L-144)—This order covers a specified list of laboratory equipment, including:

- Analytical balances of sensitivity ⅓ mg. or more
- Calorimeters
- Centrifuges
- Hydrogen ion meters (electrometric)
- Metalloscopes
- Microscopes (except Brinell and tool makers)
- Microtomes
- Potentiometers, Wheatstone bridges and resistance boxes
- Refractometers
- Spectographs, spectroscopes, spectrometers and spectophotometers
- Vacuum pumps 1 micron vacuum or higher

Such equipment can be sold or delivered only on an authorized order obtained by application from the ultimate user on WPB Form 1414 (formerly PD-620). Supplier shall be notified of authorization and rating by a specified certification form on the purchase order.

Lubrication Equipment (L-314)—Limitation Order L-314 covers all types, manual, mechanical, air, electrical, portable and stationary, of oil and grease dispensing equipment. On any unit with retail sales value of more than $25 an AA5 rating or better is now required. The order also sets detailed restrictions on sizes and types, as well as materials of construction that can be used for this equipment. Quotas are set for manufacturers. Food plants will use WPB Form 547 (formerly PD-IX) to apply for ratings on this equipment. Manufacturers will report on WPB Form 3161, beginning Jan. 10, 1944.

Motors, Electric (L-221 and M-293)—L-221 restricts purchase and sale of motors and generators, restricts types of motors manufactured to stated specifications and scheduled production. The food manufacturer buying equipment on which a motor is to be used, often buys the motor with the equipment. If he buys a motor himself, he will use WPB Form 541 (PD-1A) to apply for a rating, which will be allowed if the equipment he needs is in the right categories.

Power Trucks, Industrial (L-112)—This order makes it mandatory that all orders accepted after Oct. 15, 1943, shall be authorized. The user applies on WPB Form 1319 (PD-556) for this authorization. The manufacturer reports on WPB Form 1262 (PD-385) monthly, giving proposed production and delivery schedule and sales value of trucks and repair parts.

Pumps—Liquid (L-246, M-293)—The types of pumps used in the food field are covered in Order L-246, which states that approved pump orders are those bearing a rating of AA5 or better. WPB Form 541 (formerly PD-1A) is used by the food manufacturer to apply for rating.

Pumps, Vacuum—Turbo-Blowers, High Pressure Blowers, Compressors, Exhausters (L-123, L-163)—L-163 formerly covered turbo-blower orders, but has been superseded by Order M-293 which now governs placement and acceptance

of orders for these items as has been indicated. L-123 covers industrial compressors, and vacuum pumps, mechanically operated, of all types except for critical compressors as covered by Order M-293. Under L-123, unless an order has a rating of A-1-c or better, it is not an approved order and cannot be accepted. Under M-293, however, pumps of these types requiring 20 hp. or over, cannot be bought without authorization to purchase. The user fills out WPB Form 2948 (PD-616) to get this authorization. (This form is also used for all turbo-blowers).

On all pumps requiring less than 20 hp., the user applies for a rating on Form WPB 541 (formerly PD-1A) while the manufacturer reports schedules, etc., on WPB Form 3000 (PD-900).

Refrigeration Equipment (L-38 and L-126)—(See Air Conditioning Equipment.)

Scales (L-190)—This order specifies types, sizes and materials for construction of scales and balances, including types used in the food field. Application for a preference rating on this equipment amounting to $50 or more per sale is made by user on WPB Form 2581 (PD-857).

There are many other items of plant equipment which must be bought by the food field. As many as possible are listed below, with the governing limitation and conservation orders which apply.

Heat exchangers, power boilers, stokers, diesel and gas engines, pressure vessels, generators, turbines and circuit breakers are chiefly governed today by Conservation Order M-293, covering Critical Common Components. Some of these items must be applied for by the user on a form which requests authority to purchase. Others require application on forms specified in limitation orders covering such items. Manufacturers of certain of these items must report on certain specified forms.

In order to present this information as clearly as possible, each item is listed alphabetically below, together with the forms to be used by the user and the manufacturer to comply with the provisions of M-293.

Item	User Form [1]	Manufacturers Form or Forms [2]
Circuit breakers	———	WPB–1790 (PD–665)
Diesel and gas engines	———	WPB–878
Generators	———	WPB–1801 (PD–738)
Heat exchangers (over 12 in. dia.)	WPB–1475 PD–615	WPB–1474 (PD–615B)
Heat exchangers (under 12 in. dia.)	———	WPB–1474 (PD–615B)
Power boilers	WPB–2645 (UF–25)	WPB–1790 (PD–665)
Pressure vessels	———	WPB–3000 (PD–900) and WPB–2545 (PD–839)
Stokers	———	WPB–1790 (PD–665)
Turbines	———	WPB–3120

[1] Application for authorization to purchase.

[2] Except for pressure vessels, the form indicated is for reporting monthly on production schedule, shipped, cancelled and unfilled orders, etc.

Form WPB 2545 (PD–839) for pressure vessels, to be filled out in addition to WPB–3000, is a monthly report on production and shipments.

Cans, Containers and Drums (L-103, L-197 and M-81)—L-103 covers glass container and closure simplification schedules and types. L-197 covers steel drums and products that can be packed therein. M-81 covers restrictions on the manufacture and use of tin cans.

No attempt is made here to go into detail on these orders, since the food manufacturer has of necessity long since been forced to become familiar with these orders and their limitations.

Maintenance, Repair and Operating Supplies

Preference ratings and allotment symbols to be used in obtaining maintenance, repair and operating supplies are available to the food industry under the terms of CMP Regulation No. 5, the blanket MRO Regulation.

Under the procedures outlined in this regulation, persons engaged in industrial food manufacturing, processing, packaging, preservation and storage (except soft drink and alcoholic beverages and chewing gum) are eligible to obtain controlled materials through the use of the MRO symbol and to use an AA-1 preference rating to obtain maintenance, repair and operating supplies other than controlled materials.

Distribution of food products, as distinct from their production, is not included in the term "industrial food processing." However, in cases where a person is engaged in both production and distribution of food products, he may obtain his entire MRO requirements by using the preference rating assigned to the principal activity where, and only where, it is impracticable to apportion requirements to his several activities.

MRO, as defined in CMP Regulation No. 5, includes minor capital additions where the cost does not exceed $500 (excluding the purchaser's cost of labor) for any one complete addition. However, in many instances other orders or regulations of the War Production Board limit distribution of equipment which might otherwise be obtained under CMP Regulation No. 5. These other limits may be in the form of quantity restrictions or they may outline methods which must be followed in obtaining certain types of equipment.

The term "one complete capital addition," as used in the definition means a group of items customarily purchased together and all items which would normally be purchased as a part of a single project or plan.

It should be carefully noted that no capital addition shall be subdivided for the purpose of coming within this permission to buy minor capital additions. Where the addition involves construction, authorization to construct must be obtained *if it is required under Limitation Order L-41.*

MRO Certifications to Appear on Orders

CMP Regulation No. 5 provides three certifications which must be used in placing orders of different types for maintenance, repair and operating supplies. Two of these certifications apply to purchases of controlled materials and the third, which is of most interest to the food industry, applies to purchases of other items for MRO purposes. Certifications must be signed manually by a responsible officer of the business concerned, or as provided in Priorities Regulation No. 7.

The general certification, used in connection with MRO purposes for other than controlled materials, reads as follows:

"Preference rating ..... (specify rating) ..... MRO. The undersigned certifies, subject to the criminal penalties for misrepresentation contained in section 35 (A) of the United States Criminal Code, that the items covered by this order are required for essential maintenance, repair or operating supplies; that this order is rated and placed in compliance with CMP Regulation No. 5; and that the delivery requested will not result in a violation of the quantity restrictions contained in paragraph (f) of said regulation."

Persons who are eligible to purchase copper or steel (including wrought iron) for MRO purposes (in the food industries these are persons eligible to use the AA-1 preference rating) may obtain such materials by placing on their purchase orders substantially the following certification:

"CMP allotment symbol MRO—(P order No. ....)—The undersigned certifies, subject to the criminal penalties for misrepresentation contained in section 35 (A) of the United States Criminal Code, that the controlled materials covered by this order are required for essential maintenance, repair or operating supplies, to be used for a purpose listed in Schedule I or Schedule II of CMP Regulation No. 5 and that delivery thereof will not result in a violation of the quantity restrictions contained in paragraph (f) of said regulation."

If aluminum is required for MRO purposes, up to 100 lb. of it may be obtained by persons in the food industry who are eligible to use the AA-1 preference rating, if they will endorse their purchase orders with the following certification:

"CMP allotment symbol MRO—(P order No. ....)—The undersigned certifies, subject to the criminal penalties for misrepresentation contained in section 35 (A) of the United States Criminal Code, that the materials covered by this order are required for essential maintenance, repair or operating supplies, to be used for a purpose listed in Schedule I or II of CMP Regulation No. 5; that the use of other materials for

such purpose is impracticable; and that the amount of aluminum covered by this order, together with all other amounts received by, or on order for delivery to the undersigned, from all sources, for such purposes during the same quarter, will not exceed 100 pounds."

Attention is called to the fact that if more than 100 lb. of aluminum is required for MRO purposes, special provisions of CMP Regulation No. 5 permit application for larger amounts.

CMP Regulation No. 5 includes quantity restrictions to limit amounts of materials which manufacturers and persons engaged in business may obtain through the use of the MRO procedure. Persons using the allotment sym-

(*Turn to page 130*)

Milk and Cream Nomograph

Graphic interpolation of data on the dependence of solids-not-fat content, specific gravity and densities upon the butterfat content

By **D. S. DAVIS**
Wyandotte Chemicals Corp., Wyandotte, Mich.

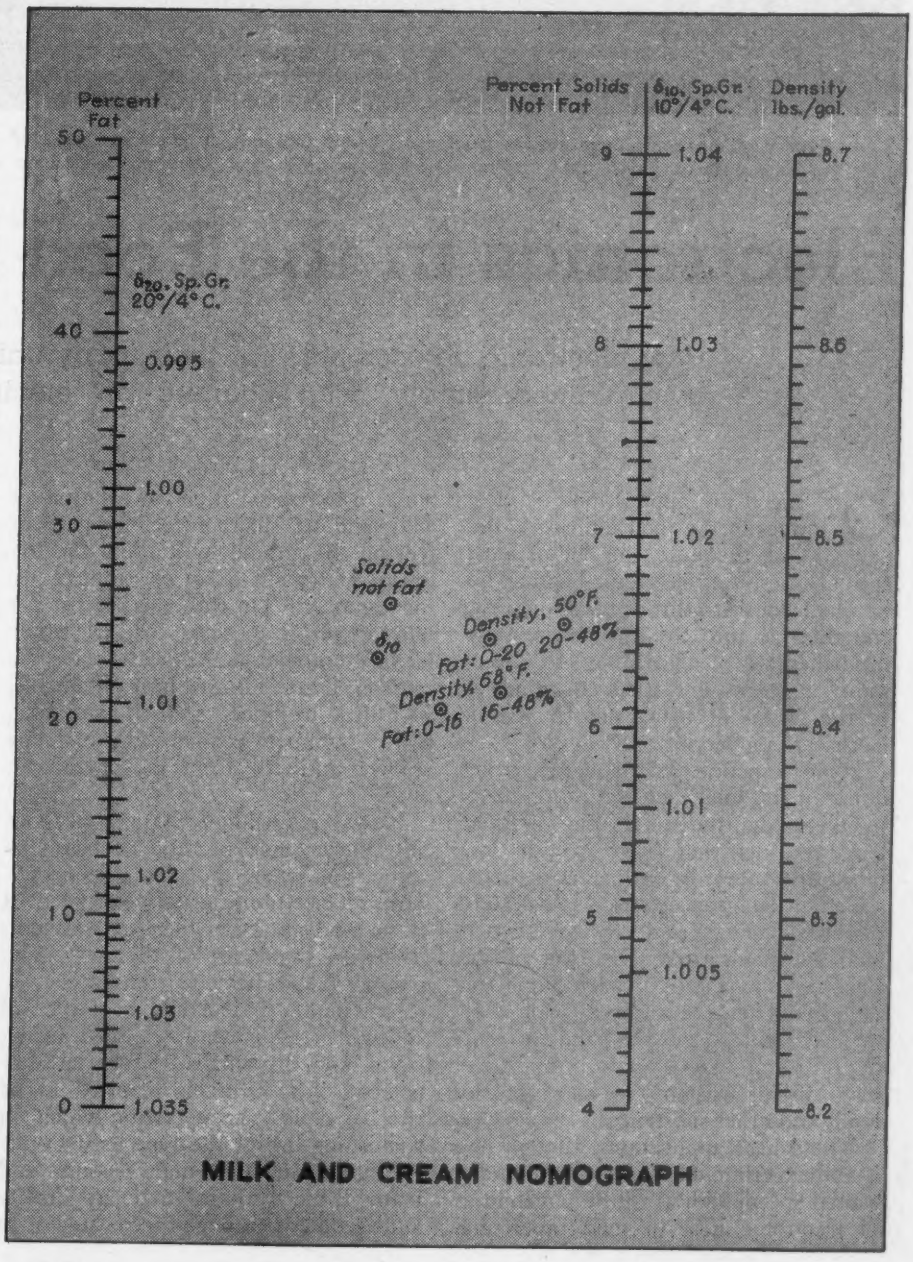
FOR milk and cream, tabular data covering the dependence of solids-not-fat content, specific gravity at 10 and 20 deg. C. referred to water at 4 deg. C, and densities in pounds per gallon at 50 and 68 deg. F. upon butterfat content have been presented previously.[2] But the accompanying line coordinate chart facilitates rapid, accurate and convenient graphical interpolation and was constructed by well-known methods.[1]

The use of the chart is illustrated as follows: What is the specific gravity (20 deg./4 deg. C.) of cream testing 20 percent butterfat? Opposite 20 on the fat scale at the left read 1.011 as the specific gravity. What is the specific gravity of this cream at 10 deg. C. referred to water at 4 deg. C.? Connect 20 on the percent fat scale with the circled point marked δ_{10} and project the line to the scale headed "δ_{10}, sp. gr. 10 deg./4 deg. C." and read the desired specific gravity at 1.017. What percentage of solids-not-fat corresponds to 20 percent butterfat? Connect 20 on the fat scale with the circled point labeled "Solids not fat", project the line to the scale headed "percent solids not fat" and read the desired value as 7.2.

What is the density at 50 deg. F. of cream which tests 15 percent fat? Note that there are two gage points for density at 50 deg. F., one for fat content below 20 percent and one for fat content above 20 percent. Connect 15 on the fat scale with the former point and project the line to the density scale, reading the desired value as 8.52 lb. per gallon.

What is the density of cream at 50 deg. F. which contains 30 percent fat? Connect 30 on the fat scale with the other gage point and read the density as 8.43 lb. per gallon.

The use of the chart in estimating densities at 68 deg. F. is entirely similar to the foregoing procedure.



References

1. D. S. Davis, "Empirical Equations and Nomography," 1st ed., p. 140, McGraw-Hill Book Co., New York, 1943.

2. *Journal of Agricultural Research*, III, No. 3, 257.

Battery of electronic bean sorting machines. Beans that are off color are detected by photoelectric tubes which actuate a mechanism to eject the bad ones. This is only one of many electronic applications in the food industries.

Electronics in the Food Plant

How electronic devices perform their many unique functions is explained simply, with pointers on electronic heating

OF the many applications of electronics in the food industries, the newest, and, therefore, the one of most current interest, is electronic heating. So we shall consider this application first, and then go into the most elementary fundamentals of electronics to dispel some of the mystery that enshrouds it in the minds of many not trained in electrical engineering.

Some experimental work is being done on the final dehydration of foods by electronic heat after the product has been dehydrated to a fairly low moisture content by orthodox methods, and then compressed into bricks. Very high-frequency current is used, generated by an electronic oscillator of the type used in radio broadcasting. And high-frequency heating is in wide commercial use for "flowing" the tin coating on electrolytic tinplate to make the plate more resistant to corrosion by foods and other substances.

These heat applications, though one is still experimental, have very naturally caused speculation as to the possibilities of electronic heat in food processing. Some of this speculation has been rather wild, and we shall proceed to get our feet on the ground by quoting the following statement of an electronic heating engineer: "On the basis of cost per kilowatt of heat generated, electronic heaters represent at the present time the most expensive form of heat obtainable, with little likelihood of their ever being able to compete economically in many applications with steam, resistance heat, etc."

Now the final dehydration of foods has shown some promise of being an application where the unique characteristics of electronic heaters can be used to such advantage as to offset the comparatively high cost of the heat. The product is heated simultaneously throughout its thickness very quickly and with close control—decided advantages. And the removal of the last few percent of moisture is reported to be effected rapidly, an operation which, in a finishing bin of the type used by dehydrators, requires many hours and many B.t.u. Perhaps there are quality and economy-through-speed angles to this process that will more than justify the extra cost. Further experimental work will tell. And perhaps there are other heat process applications where electronic heat will be an advantage in the food plant, but it will take some research to reveal them.

In flowing tin on electrolytic tinplate by electronic heat, commercial success has proved the merits of the application. Here the close control of the temperature and the uniformity of heating avoids spoilage and gives consistently good and high quality results. And, of course, much less tin is used on electrolytic plate than a hot-dipped plate, a critical wartime consideration.

These two processes, incidentally, utilize different types of electronic heating—dielectric heating for the food (a nonmetallic substance) and induction heating for the tinplate (a metallic material).

In dielectric heating, which is essentially a voltage phenomenon, the food is placed between two metal plates in the electrical circuit, thus forming a capacitor, or condenser, and a high-

frequency voltage is applied to the plates. Losses occur even in the best of capacitors in ordinary use because the dielectric material or "insulator" between the plates is not perfect. And with materials such as a compressed, partially dehydrated food or a steak, which have high dielectric losses, considerable power in the form of heat can be generated within them. Since this phenomena involves both a certain amount of conduction losses and heat generated by molecular friction due to the alternating electric field existing throughout the material, the heat is distributed uniformly through the mass.

In induction heating the metallic object to be heated is placed in or adjacent to a water-cooled coil which carries a high-frequency alternating current. The magnetic field thus produced causes a current to flow in the surface of the object by a process similar to that which takes place in the transformer, and the object is heated by resistance losses incurred by the currents established. The heat is generated entirely in a surface layer, the depth of which is determined by the frequency used.

While induction heating is for metals, it conceivably could be used to heat food by first heating a metal container, conveyor belt or pipe with which the food is in contact. But this would lack the advantage of dielectric heating in which the product is heated from the inside out, so to speak. And if you are going to heat a food by first heating the container, it would seem logical to use steam or a gas fire, since that would be very much more economical. Or infrared lamps could be used to heat the product by direct radiation.

Entirely aside from heat applications electronic devices are extensively used in food plants. One of the commonest is the photoelectric cell, which counts packages as they pass on a conveyor, controls the register of the design on small packages wrapped by high-speed machines, sorts out bad beans by their color, and similar fast precision operations where a variation of the intensity of reflected or transmitted light is a measure of a variable. Another device used is the electronically operated temperature controller, an application of this being shown in another article in this issue, "Automatic Control of the Dehydration Processes." Electronic rectifiers convert alternating current to direct current for charging the batteries of electric delivery and materials-handling trucks. X-ray machines are used for inspecting the contents of sealed packages on the production line, and for inspecting such products as candy for foreign materials and oranges for frost damage. Fluorescent lamps light the inspection tables in many food plants and the ultraviolet lamp which kills bacteria and mold spores has found wide application in the industry. A new development, the electron microscope, has a big potential future in bacteriological research and control. In fact, all of the various abilities of electron tubes are put to work in the food industry, these being (1) to rectify, (2) to amplify, (3) to "generate," (4) to control, (5) to transfer light into current and (6) to transform current into light or rays.

Having considered what electronics will do in the food plants, let's strip a bit of the mystery from the theory of it.

In order to function, of course, an electronic tube must be connected in

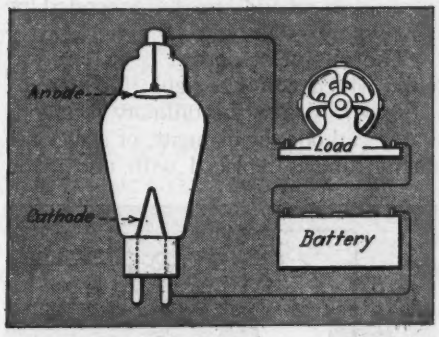


FIG. 1. Explanatory diagram showing an electron tube in an electrical circuit, with no current flowing because the cathode is not heated to emit electrons.

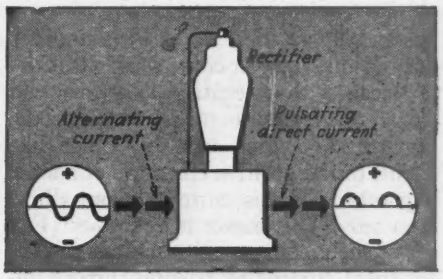


FIG. 3. If alternating current is applied to a two-element electron tube, a direct, pulsating current is obtained, as the current passes through the tube in one direction only. This rectifying action produces, in effect, a direct current.

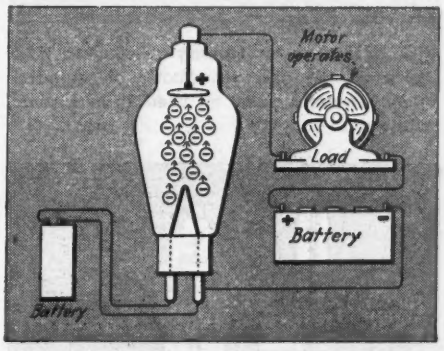


FIG. 2. The same hookup as in Fig. 1, but here a battery heats the filament and electrons flow through the tube and a current through the circuit.

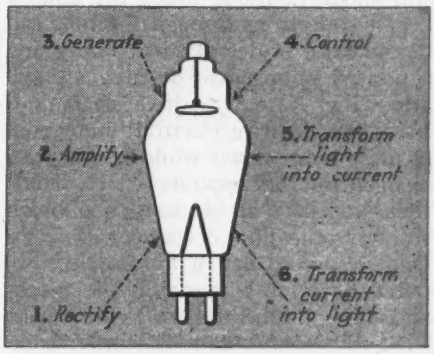


FIG. 4. The electron tube will rectify, amplify, "generate" or oscillate, control, transform light into current and current into light, making it a valuable tool in industry.

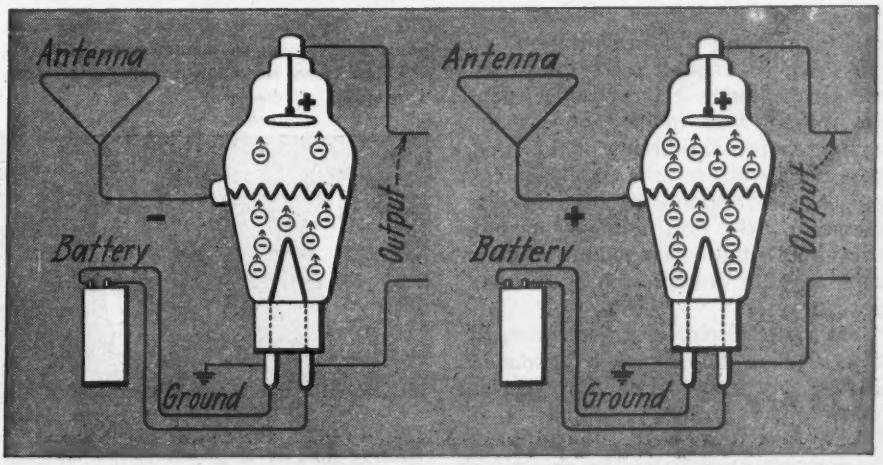


FIG. 5. If an element, called a grid, is placed between the cathode and anode of an electron tube, as in a radio circuit, the flow of electrons through the tube is reduced when a negative potential is applied to that element and the flow is increased when a positive potential is applied. This characteristic enables the tube to amplify an impulse applied to the grid and to control industrial processes.

an electrical circuit. As a circuit element, it simply fills a gap where the circuit has been cut and the tube inserted (Fig. 1). Here in the space between two electrodes the current is conducted by a cloud of many billions of electrons (Fig. 2), in some cases aided by positive ions. Here you have electrical conduction simplified to its fundamentals.

Thus, a little gap of a few mils to a few inches in length in a high vacuum or in a low-pressure atmosphere of some gas or vapor offers several possibilities for unique circuit-control application.

Because the negative electrons will flow only from the negative electrode, or cathode, which may be a hot filament, to the positive electrode or anode, the tube will pass current in one direction only. This makes it a rectifier (Fig. 3), which converts alternating current to direct current by passing current impulses in one direction but not in the other, as it does in a battery charger. This simple type of two-element tube is called a diode.

If a third element, called a grid, is placed in the tube between the cathode and anode (a triode tube) the flow of negative electrons through the tube can be increased or decreased by impressing a positive or negative potential on the grid (Fig. 5). A positive charge attracts the negative electrons and so increases their flow, while a negative charge has the opposite effect. Here, then, you have an electron tube which will vary the flow of current in a circuit in accordance with an electrical potential set up by some outside agency and acting on the grid. In a radio, when the grid is connected in the antenna circuit, the tube greatly amplifies the very weak signals received from the broadcast station by controlling the flow of power through the tube circuit, the controlled power coming from the commercial power lines. By using a series of tubes and multiplying the amplification, the radio delivers enough power to a loudspeaker to vibrate it and produce sound duplicating that in the broadcasting studio. And in this ability of the triode tube lies its power to control industrial processes in response to a variable impressed on the grid as a varying electrical potential. Temperature, speed, time or other variables can be the actuating agent.

By a special circuit arrangement, the electron tube can be made to "generate" a high-frequency alternating current when direct current is supplied to it. The circuit is shown in Fig. 6 and is known as an oscillator. In this circuit the direct current is amplified in the usual way and is then "fed back" to the grid through an inductive coupling or transformer. The feed-back acting on the grid varies the flow of electrons through the tube in such a way as to set up pulsations of current in the exterior circuit. This circuit contains inductance (a coil) and capacitance (a condenser), such a circuit facilitating oscillation of the current as a result of the opposing action of the capacitance and inductance much as a coil spring will oscillate when it is compressed and then released. Frequencies of up to about a billion cycles per second can be generated in this way.

The photoelectric cell is an electron tube which converts light into current (Fig. 8). When the ordinary heat-activated cathode, or filament, of a two-element tube is replaced with one made of photosensitive, or light sensitive, material, light can replace heat as a stimulator of electron emission. By feeding the feeble current so produced to the grid of an amplifying type of electron tube the current can be stepped up until it will control a great amount of power. This means that photoelectric tubes can function as light relays to control wrapping and other operations.

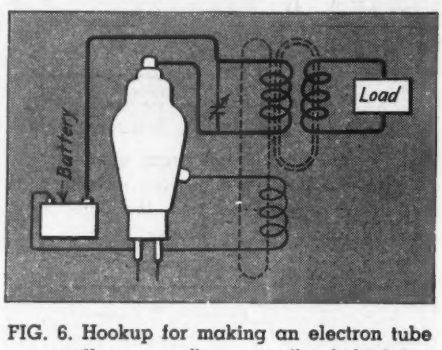


FIG. 6. Hookup for making an electron tube an oscillator or "generator" of high-frequency current such as used in electronic heating.

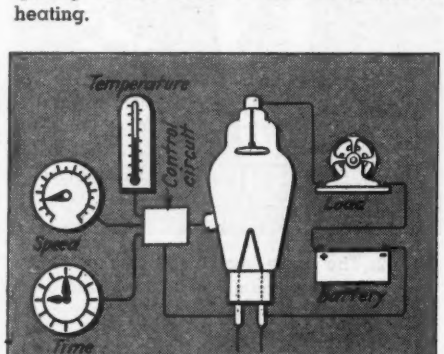


FIG. 7. The electron tube will control such process variables as temperature, time and speed if these variables are made to apply a potential to the grid.

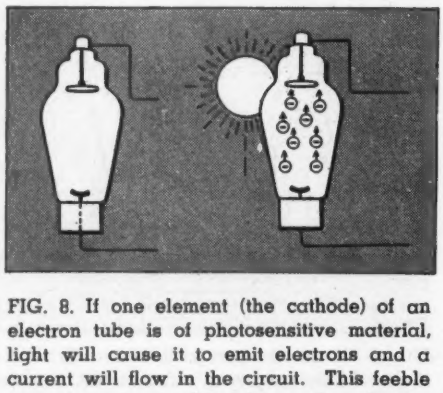


FIG. 8. If one element (the cathode) of an electron tube is of photosensitive material, light will cause it to emit electrons and a current will flow in the circuit. This feeble current can be amplified by another electron tube and used to control industrial apparatus.

Besides converting light into electric current, electron tubes can convert current into light and into x-rays and ultraviolet rays. The cathode-ray tube lights a fluorescent screen, as on a television receiver, because the beam causes the minerals on the screen to fluoresce, or emit light, when it strikes them.

The x-ray tube also converts current into rays which will register on a fluorescent screen or a photographic plate, revealing objects in the path of the rays which block part of the beam. Thus a nail will show up inside a sealed package of food and frost damage is revealed inside of what appears to be a perfect orange. In the x-ray tube a high potential ranging up to 300,000 volts or more is applied between the anode and cathode. Electrons are emitted by a focusing cathode, and because of the extremely high voltage these electrons hit the anode with tremendous impact and cause the emission of waves, called x-rays, of exceptionally high frequency.

Electronic conversion of current into light is the basis of the whole field of modern fluorescent lighting. Such lights produce more than twice as many lumens per watt as incandescent lamps.

A slight variation of the principle involved in these lamps results in a source of ultraviolet radiation used in food plants to kill molds and bacteria.

One of the newest electronic devices is the electron microscope, which, because the electron is so much smaller than the wave length of light, obtains magnification many times that of the optical microscope. The latter cannot magnify any particle smaller than the wave length of light. In the electron microscope a beam of electrons takes the place of light and electromagnetic fields the place of optical lenses. The beam is spread for magnification and focused to produce the image, striking a fluorescent screen or a photographic plate to produce the image.

Electronic tubes function without inertia, act practically instantaneously, and are affected by unbelievably minute impulses. Yet as built today, industrial electronic equipment is sturdy and is easily manipulated by operating men in the plant. These qualities make it an exceptionally useful industrial tool, and one which can be used to do things that can be done in no other way.

What Is a Food Engineer?

By G. L. MONTGOMERY, Associate Editor of "Food Industries."

With the establishment of college courses in food technology and engineering, confusion has arisen in some minds as to the meanings of these terms. The food engineer is the creator, designer and operator of the entire food processing set up, and must not be confused with the power engineer, maintenance man or building superintendent

SOME eight or ten years ago the technology and engineering of food processing began to be taught in our colleges and universities as formal courses leading to specific degrees. However, these courses have not yet been standardized as to curricula, and much confusion as to their scope exists in both academic and industrial circles. In fact, there are still many in the food field who deny the existence of any such branches of applied science as food technology and food engineering.

However, there exist not only an increasing number of undergraduate and graduate courses in these subjects, but there is also the Institute of Food Technologists, some five years old and 1,400 strong. Therefore, it may be of profit to examine this situation, to see wherein the confusion lies, and to try to clarify thinking on the subject.

For the sake of clarity, perhaps one should go back to the days before food technology and engineering, and recall what the situation then was. Food processing operations were then, as they had been for ages past, largely a matter of traditional skill and experience. Or, one might say, food processing was an "art." Science has since entered into the matter and is playing an increasingly important part. But its application had not these been systematized.

With growing government regulation of such foods as fluid milk, meat, and canned fruits and vegetables, and with the advent of pure food laws, scientific control became a necessity. As a result, the food chemist and the bacteriologist have come to occupy increasingly important places in food processing industries, particularly through the control laboratory. And their influence has penetrated beyond the laboratory walls—out into the plant and the processing operations.

Coincident with this development, drastic changes in the living habits of people occurred, as manufacturing industries grew and caused a shift from rural to urban living. This put the emphasis on factory processed foods as against home grown and processed foods, resulting in a rapid expansion of the food processing industries and in a greatly enhanced competition for the expanding urban market.

While this was going on, manufacturing industries in general were emerging from the era of control by skilled mechanics and artisans, into the present period of control by the engineer and technologist—the era of mass production. And food processing has also been influenced by this trend.

All of these factors have acted together to bring about a situation in which successful food manufacturing enterprises are finding it more and more advisable to place their manufacturing operations under the control of adequately trained technical men.

Duties of Technologist and Engineer

Broadly classified, the duties of the technically trained men who are coming to control food processing operations fall into two groups: those of the *technologist* and those of the *engineer*.

To get a clearer understanding of the distinction between these two types of training, we have only to turn to the dictionary. Webster defines technology as "any practical art utilizing scientific knowledge: applied science contrasted with pure science." That indicates that technology is science come out of the laboratory into the plant, and the technologist is the man who brings science into the plant and uses it to control the quality of the foods that are being processed there. Looked at in this light, the food technologist is the man who, in the factory, employs such sciences as chemistry, bacteriology and physics to control the raw materials that enter the factory, to control the processing of these materials and, finally, to control the packaging and storage of the finished foods, so that products of a predetermined quality are available to consumers.

In contrast, let us look at Webster's definition of engineering (and specifically, the definition for chemical engineering, which comes nearest to food engineering, as yet undefined). Webster says, "Engineering: The art and science by which the properties of matter and the sources of power in nature are made useful to man in structures, machines and manufactured products." "Chemical Engineering. The preparation, manipulation and transformation of materials; and the design, construction and economic operation of equipment for carrying out such operations."

The Engineer's Responsibility

When we consider these two definitions, *i.e.*, for technology and for engineering, it immediately becomes evident that the engineer is the man who is responsible for operating the plant in an economical manner. He must see that the equipment is suitable for the processing that is being carried out, even designing equipment when no suitable equipment can be purchased. He is charged with the responsibility for the economical operation of the equipment, to the end that the product is processed in accordance with the dictates of the food technologist, and at the lowest practicable cost.

This matter of economic operation is the most important function of the food engineer. In a highly competitive market, which characterizes food distribution, successful manufacturers must produce at a cost low enough to permit a profit. Food engineers are trained to consider matters of cost as of first importance.

And finally, the food engineer is also responsible for use of such facilities as steam, heat, electricity and refrigeration.

To sum up briefly, the food technologist is the man who controls what is done in a food processing operation, while the food engineer is the man who controls the equipment for doing it and the economical operation of that equipment.

Infrared Speeds Fish Drying

Lamps used in conjunction with air blast to dry shredded salted cod in a continuous operation. Equipment made in plant shops

By L. V. BURTON,
Editor of "Food Industries."

ONE of the early applications of infrared lamps for drying foods in a continuous operation has been put into successful service during the current year at the Gorton plant of Gorton-Pew Fisheries Co., Gloucester, Mass.

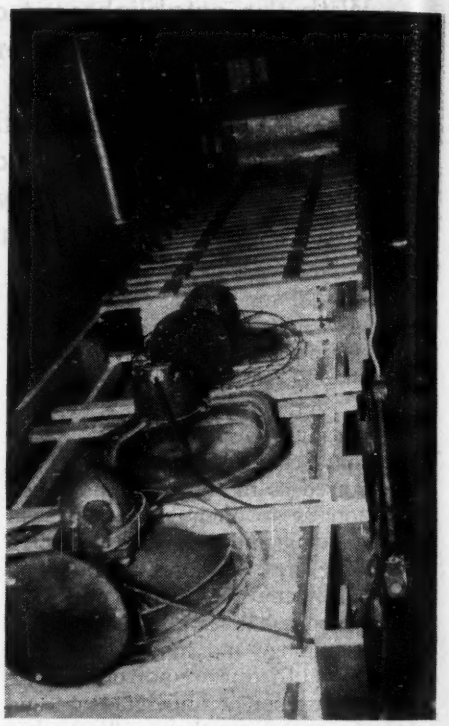
The new dryer built by the fish company to dry shredded salted cod is the creation of Richard F. Fialho, electrician, and John M. Kohr, assistant food technologist, now production manager of the company.

Wartime necessity has compelled the use of more paper packages and fewer metal containers for Gorton-Pew fish products. The war also has forced the adoption of more rapid production methods so as to keep up a large volume on a reduced supply of available workers.

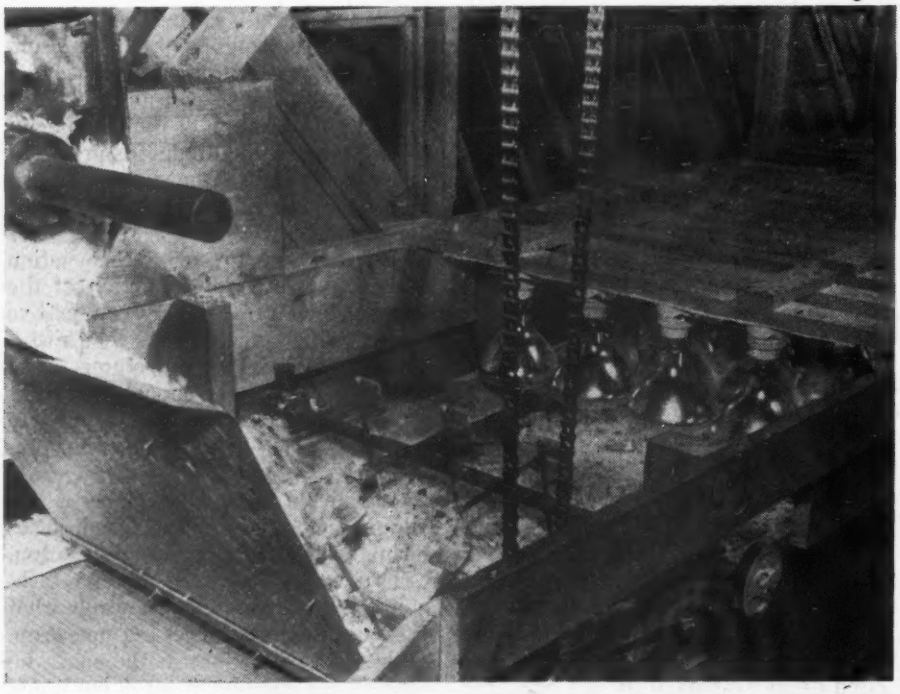
Shredded salt cod fish has been dried to about 60 to 65 percent moisture by so-called natural drying in the flake yards, but this moisture content is too high for ultimate safety against spoilage in tight packages in warm climate. Experience has shown that a moderate amount of artificial drying to further reduce the moisture content from 60 or more percent to 43 percent is necessary for freedom from possible deterioration under all conditions. Prior to 1943, the Gorton-Pew Fisheries Co. had used a cabinet dryer to achieve this margin of safety. This was a slow batch operation. Also, it required the attention of one or two men who, during the war, are urgently needed for other work.

When Richard F. Fialho returned from a lighting conference at the Lynn plant of General Electric Co. he had the germ of the idea that was to speed up the drying operation and produce a better product. Drying is now continuous at the rate of 4,000 to 4,300 lb. per 7½ hours of actual operating time. Infrared lamps in two banks of 112, each lamp drawing 250 watts, consume about 56,000 watts of power for the operation.

The method is not, however, a direct adaptation of the spectacular drying methods used to dry paint on Army tanks and auto bodies in 14 minutes, for the moisture entrapped in the shredded cod must be removed by an air blast or it would be reabsorbed by the product as soon as it leaves the zone of heating. Furthermore, there is the matter of heat sensitivity of the food to be considered, for although salt cod is not as heat sensitive as many other foods, it must be treated with care. Therefore, as worked out in this plant, the infrared rays heat the product from the top while fresh cold air is blown through it from the bottom as it travels in a fluffy layer about ½ in. thick at 6 ft. per minute.



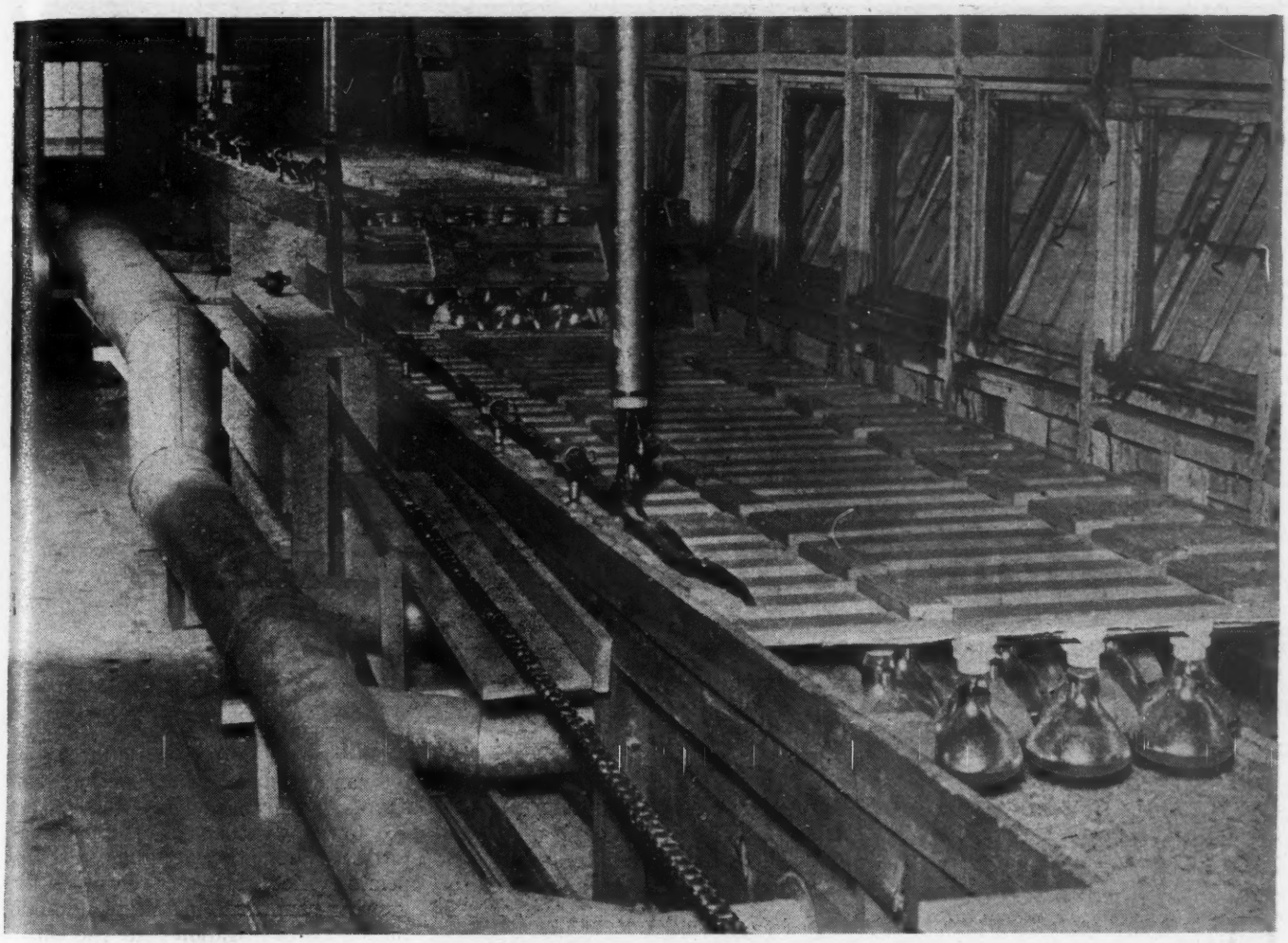
Discharge end of dryer, showing the three electric fans which blow air down on the shredded fish after it passes out from under the infrared lamps, further cooling the product and accomplishing some additional drying.



Feed end of dryer, showing end of screw-type feed conveyor at extreme left, revolving paddles which fluff the product and spread it on the belt, and some of the infrared lamps.

Figure 1 shows in diagrammatic manner the character of the equipment, nearly all of which was fabricated in the company's own shops from odds and ends, pieces of scrap metal and very few priority items. Even the blower was home-made.

The conveyor belt is stainless steel wire cloth made by Cambridge Wire Cloth Co. Lamps are both General Electric and Westinghouse, of 250 watts, installed in 7 lamps per circuit



Infrared drying of shredded salted cod. The lamps heat the product as it passes under them on a wire cloth belt, and unheated air is blown through the product from underneath to cool the fish and carry off the moisture. Not shown are three electric fans which supply additional cooling and drying effect as the conveyor travels beyond the last lamps.

and 86 lamps per panel. Three 100-ampere panels are required to handle the power load. The electric power is purchased at a rate of $0.0125 per kilowatt-hour. The life of the infrared lamps is about two years under this daily service. They cost new about $1.40 each.

Although the dryer works satisfactorily now, the company plans to install additional temperature control equipment to make it foolproof. There is always the possibility that the blower might stop or the conveyor motor fail with all lamps going and the dryer full of product; or that an operator might forget to turn on the lamps or the blower.

Conceivably, the product could be inadvertently scorched, or not dried at all. In view of the difficulties of procuring new equipment Mr. Fialho is trying to devise an interlocking control system that may be fabricated out of the accumulated odds and ends that may be found around a plant that is over a century old.

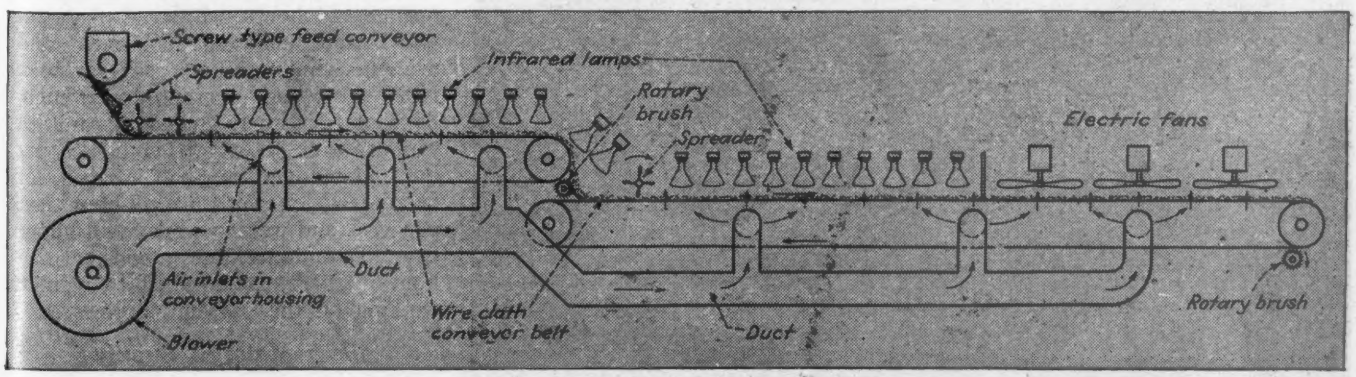
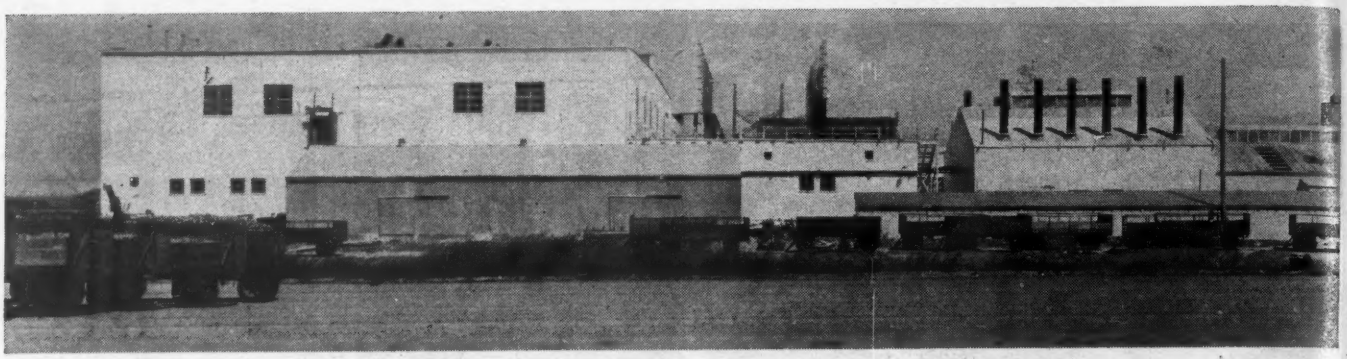


FIG. 1. Diagram of the infrared dryer (elevation). The feed is at the left, then come two spreaders and a group of infrared lamps. As the product reaches the end of the first stage, it drops to the conveyor in the second stage, is spread out by revolving paddles, passes under the second group of lamps and then under three fans. Air is blown through the product from underneath the conveyor in both stages. More lamps can be installed in place of the three fans to boost capacity.



Recently completed dehydration plant of Spiegl Foods Co., Salinas, Calif.

New Dehydration Plant Handles Record Quantities

By C. R. HAVIGHORST, "Food Industries," San Francisco, Calif.

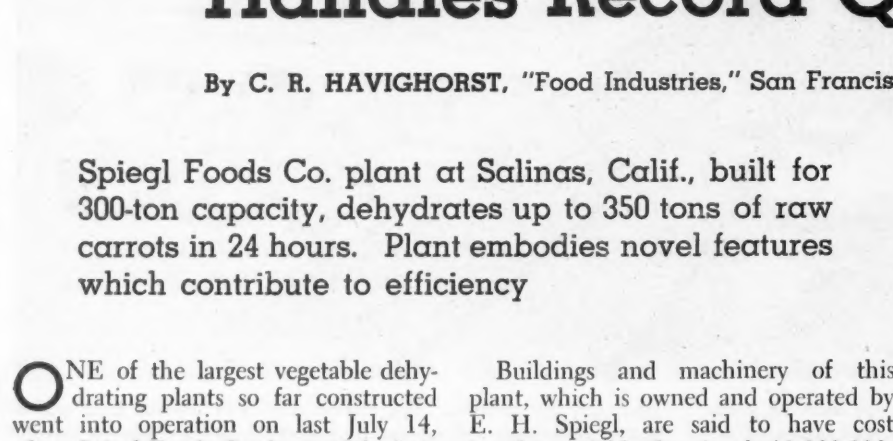
Spiegl Foods Co. plant at Salinas, Calif., built for 300-ton capacity, dehydrates up to 350 tons of raw carrots in 24 hours. Plant embodies novel features which contribute to efficiency

ONE of the largest vegetable dehydrating plants so far constructed went into operation on last July 14, when Spiegl Foods Co. began dehydrating carrots in a new plant at Salinas, Calif. The planned capacity of 300 tons of raw carrots processed in 24 hours was reached by August 20 and, in September, at the peak of carrot harvest, a record was reached of 350 tons processed each day.

Buildings and machinery of this plant, which is owned and operated by E. H. Spiegl, are said to have cost in the neighborhood of $1,000,000. The plant manager is Leo Maller, with F. S. Peters as operating superintendent and Warren Hawley in charge of field operations.

The new plant is well located for both raw material and labor supply. The Salinas Valley area of California is a large producer of vegetables for the fresh market, including lettuce, carrots and cabbage. Yield per acre of carrots in this area runs from 20 to 25 tons, with red core Chantenay carrots running heavier than the Imperator variety. However, owing to the growing conditions in this section and the system of irrigation used, the Chantenay variety shows extreme irregularity of sizes at maturity, hence the Imperator variety is preferred for dehydration, as it is uniform in size, color, sweet flavor and texture. Figures on the Spiegl operation indicate that 12 lb. of raw carrots yields 1 lb. of dehydrated diced carrots.

Although there is no overabundance of labor in the Salinas region, there have so far been no critical labor shortages. Most of the industries in the section have identical wage scales, resulting in low labor turnover. The plant operates 24 hours per day, 7 days per week, and employs 957 men and women. Minimum base pay for men is 90 cents per hour and for women, 80 cents per hour, graded upward for various skills to a top of $1.15 per hour. Time and one-half is paid for overtime. Men work five 12-hour days per week and women work five 10-hour days. Ten-minute rest periods, at 2½-hour intervals, are allowed to women working on the preparation lines.



Part of the "merry-go-round" conveyor on which vegetables are trimmed at Spiegl Foods Co.

Raw Material Supply

Spiegl Foods Co. obtains its raw material by means of contracts with growers within a 30-mile radius of the plant. It also owns and operates a 3,850-

acre farm. In addition, the company owns 65 farm tractors, to aid in farming and harvesting operations.

A method of harvesting, originally developed by E. H. Spiegl for lettuce, but since applied to carrots and other vegetables, is employed. By this method, after the carrots have been ploughed up with a carrot lifter, workers top them and throw them into the hopper of an inclined conveyor. The conveyor loads the carrots into a truck trailer. Both conveyor and trailer are hauled by a tractor. The wheel gages of the conveyor and trailer are each 46 in., so that the wheels use the shallow irrigation ditches as tracks. Conveyors are inclined approximately 35 deg., and belts are constructed of light metal bars, spaced 2 in. apart. There are four of these conveyors.

Floors of the trailers are covered with tinned sheet metal. Trailer sides are hinged at the top, so that when unlatched the sides swing free to permit easy unloading. At the plant, trailers are drawn onto a platform adjacent to the receiving conveyor. The side nearest the conveyor is unlatched. Then the platform is tilted by means of a Shepard-Niles hoist. This causes the vegetables to slide out through the unlatched door onto the conveyor. Fifty-four of these four-wheel trailers are in use.

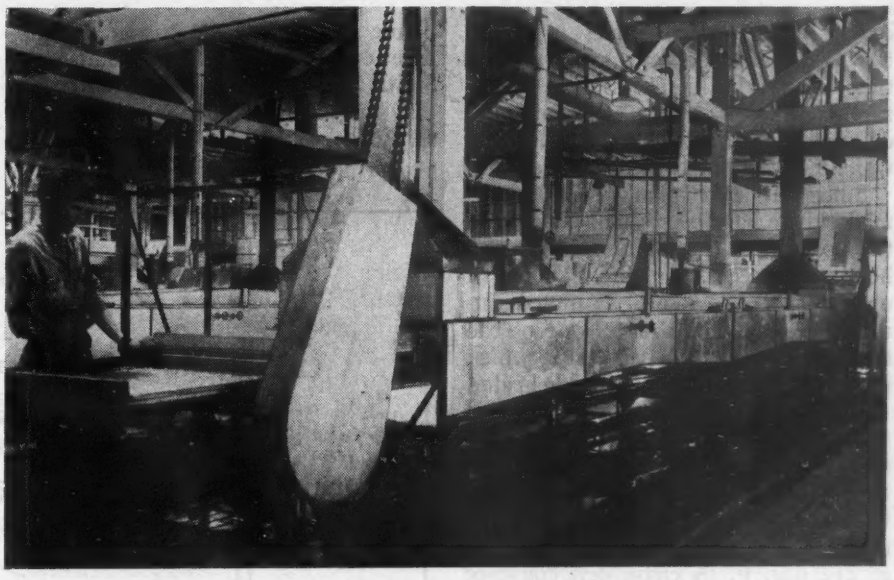
The plant uses 450 gal. of water per minute, supplied from two wells. Waste water is delivered to the city sewage system.

Preparation Methods

Referring to the accompanying plan of the first floor of the plant (Fig. 1), carrots are unloaded from the trailers to the receiving conveyer. This is a slow moving conveyor, 27 ft. wide and 32 ft. long, with a capacity of over 16 tons at one time. It is constructed of 2x4's, carried on a series of endless chains operating over sprockets.

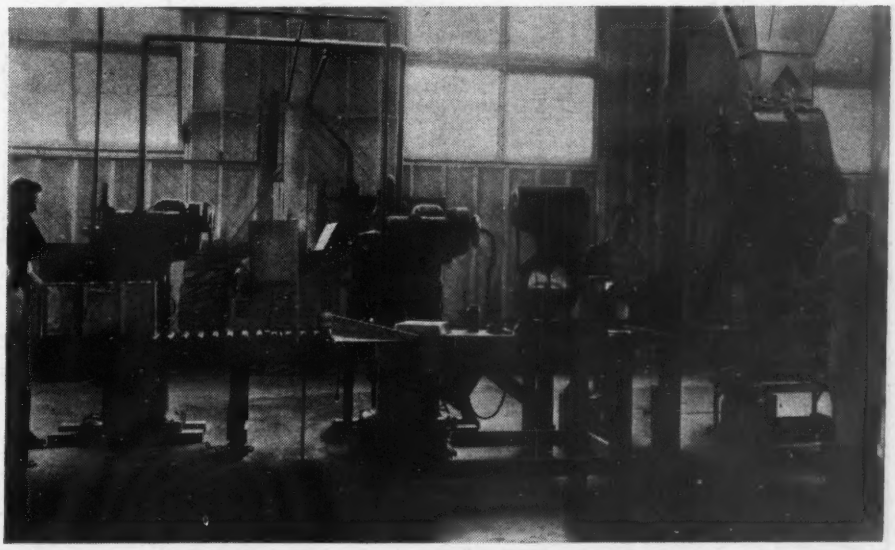
From the receiving conveyor, the vegetables are delivered to a circular, "merry-go-round" conveyor (shown in Fig. 1, with a detail in Fig. 2). This consists of an endless, rigid belt, traveling in a circle of 115-ft. diameter, slightly inclined so that the outer rim is higher than the inner rim. By means of spacing boards, the surface of the belt is divided into three sections—a center section to which the vegetables are delivered from the receiving conveyor, an outer section to receive the trimmed carrots, and an inner section to receive the trimmings and waste. Working along the inside edge of this circular belt, women top and trim the vegetables.

Trimmed carrots are delivered to one



Continuous steam blancher at Spiegl Foods Co., one of 12 blanchers in which trays of diced carrots are exposed to live steam for 10 minutes.

Transfer tracks between the first and second stage dehydration tunnels.



Cars of dehydrated carrots are filled, gassed and sealed on these machines at Spiegl Foods Co.

or the other of the flumes in which they are conveyed—and at the same time washed by high-pressure sprays—to the rotary washers. Trimmings are delivered by the belt to an elevator, which conveys them to the waste bin.

Since the floor plan (Fig. 1) was made, there have been slight changes in the position of the rotary washers, preheaters and peelers, but the sequence of operations is the same. Trimmed carrots from the flumes enter one of the two high-pressure rotary washers, which in turn delivers them to a preheater. (Preheating of carrots having been found to be unnecessary, these preheaters now serve as additional washers.) From the preheaters, the carrots pass to lye peelers, where they are peeled in a 5 percent lye solution which is held at 212 deg. F. A chain belt conveyor takes the carrots through this bath in approximately 2 minutes and 40 seconds.

After treatment, the carrots move to another set of high pressure rotary washers, which serve to remove the skins that were loosened in the lye bath. The peeled carrots then pass to a final inspection department, where they move on belts past the inspectors, so that any imperfectly peeled or otherwise unsatisfactory units can be removed before dicing. All preparation equipment except the conveyors was made by Smith Mfg. Co., San Jose, Calif.

Dicing is carried out by means of six Model B Urschel dicers, placed in a balcony over the blanchers. The whole carrots are delivered to the dicers by an enclosed belt conveyor. From the dicers, the material is returned to a conveyor that passes the intake ends of

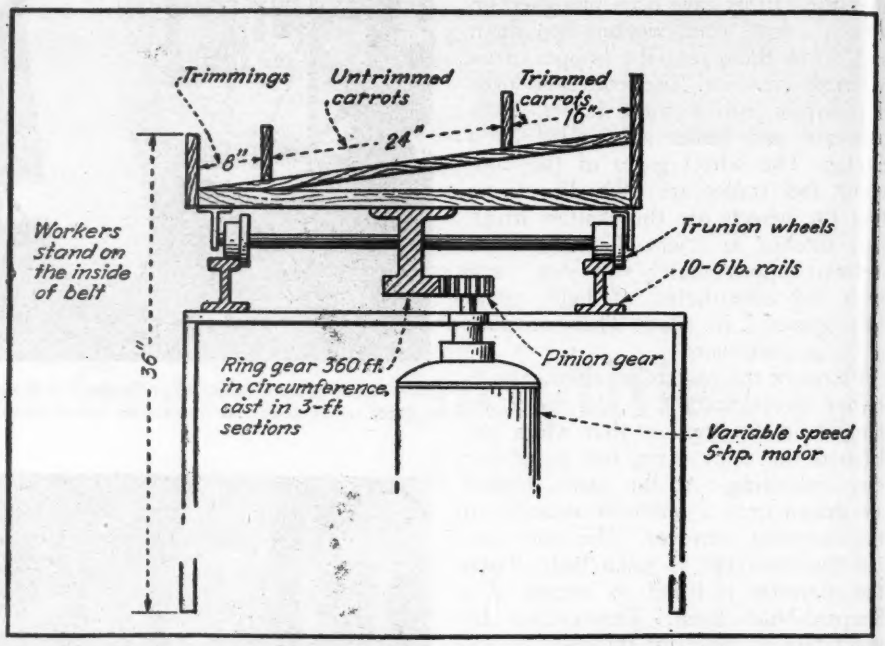


FIG. 2. Detail of construction of the "merry-go-round" conveyor used in the preparation of carrots at Spiegl Foods Co.

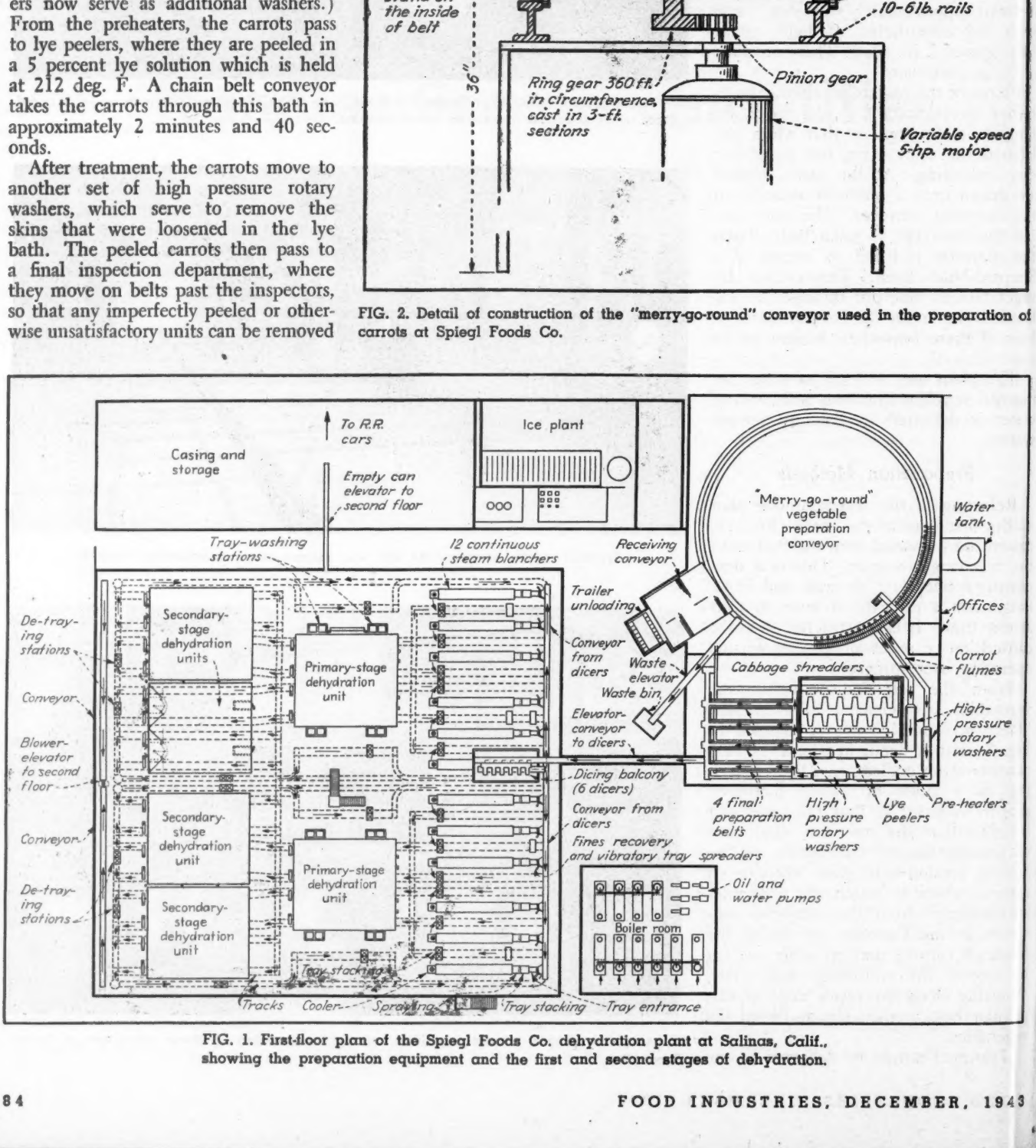


FIG. 1. First-floor plan of the Spiegl Foods Co. dehydration plant at Salinas, Calif., showing the preparation equipment and the first and second stages of dehydration.

the 12 blanchers. This conveyor delivers the diced carrots to hoppers which, in turn, feed trayers, where the material is evenly spread on trays by Syntron vibratory spreaders. The fines are screened out through the perforated bottom of the spreaders as the trays are loaded. Next, trays are stacked two high, sprayed with cold water, and then pass to the blanchers.

Blanching

Twelve continuous steam blanchers are used, in which the trays are conveyed through a bath of steam. Time of passage approximates 10 minutes and the temperature of the steam, at about atmospheric pressure, averages 212 deg. F. These blanchers are 4 ft. wide, 30 in. deep and 43 ft. long and stand on 36-in. legs. After blanching, the trays are stacked by hand on the dehydrater trucks.

Dehydration

In this plant carrot dehydration is a two-stage operation. The two stages are carried out in tunnels, through which the diced carrots are moved on trays stacked on trucks, there being two stacks, each 20 trays high, to a truck. The tunnels and accessory equipment were designed by E. H. Guthier & Co., Santa Ana, Calif., and the metal work in this department was fabricated by James A. Nelson Co., San Francisco, Calif.

First stage, or primary, dehydration is carried out in eight tunnels, arranged in two separate units of four tunnels each. Each tunnel is 6½x6½ ft. and 48 ft. long, and accommodates 12 trucks when fully loaded. Air flow in this first stage is parallel to the movement of the trucks. Air-deflecting baffles, controlled by winches at the exit ends of the tunnels, control the flow of heated air when the entrance doors are opened for charging.

Air for heating the tunnels is heated by means of natural gas. Blowers circulate the heated air at 750 cu. ft. per minute, and the used air is recirculated. The dry-bulb temperature of the entering air is 185 deg. F. and the wet-bulb temperature is 120 deg., while the dry- and wet-bulb temperatures at the tunnel exit are 119 deg. and 95 deg. respectively. Passage through this primary stage takes 2½ hours, after which treatment the moisture in the carrots has been reduced, on the average, by 75 percent.

The second stage of dehydration takes place in 16 counter-current air flow tunnels, arranged in four units of four tunnels each. These units are similar in dimensions to the primary-stage tunnels. Air, heated in the same way, is circulated through these tunnels at 750 cu.ft. per minute This air enters the tunnels at 158 deg. F. dry bulb and 98 deg. F. wet bulb and leaves at 139 deg. F. dry bulb and 88 deg. wet bulb. Passage through these secondary dehydrater units requires 6 hours.

When operating on carrots, the product leaves the second-stage dehydrater with a final moisture content of between 3.5 and 4.5 percent. As this is well below the specified maximum moisture content for the product, it is not necessary to use the third dehydration stage, or so-called "finishing" bins on these carrots. However, a battery of these bins is installed on the second floor of the plant, above the second-stage dehydraters.

The primary and secondary dehydrating tunnels are equipped with suitable controllers to maintain the desired temperatures and humidities. These are of Taylor "Fulscope" type.

The product is removed from the trays when it leaves the second-stage dehydrater and is dumped onto a belt conveyor which delivers it to a hopper where the intake of the blower-type conveyor picks it up and it is blown through an 8-in. pipe to the second floor.

Packaging

The blower-type conveyor delivers the dehydrated vegetable to a storage bin on the second floor. It is then fed to a Syntron vibratory shaker, which separates out the fines and delivers the product to a final inspection belt.

From this inspection belt, the product is delivered to an overhead bin. By means of a feed hopper, material feeds from the bin into a Parsons automatic weighing filling machine, which automatically weighs out the required amount and releases it to a can that is placed below on a shaker.

(Turn to page 134)

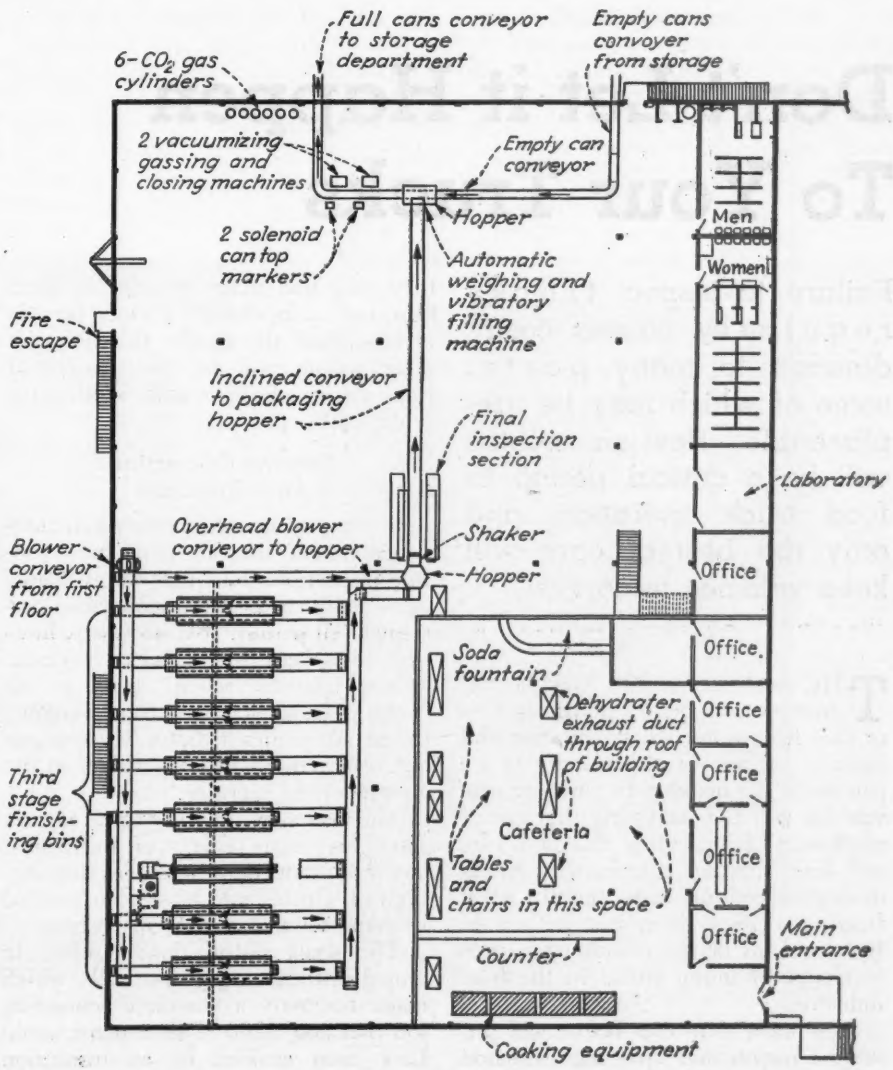
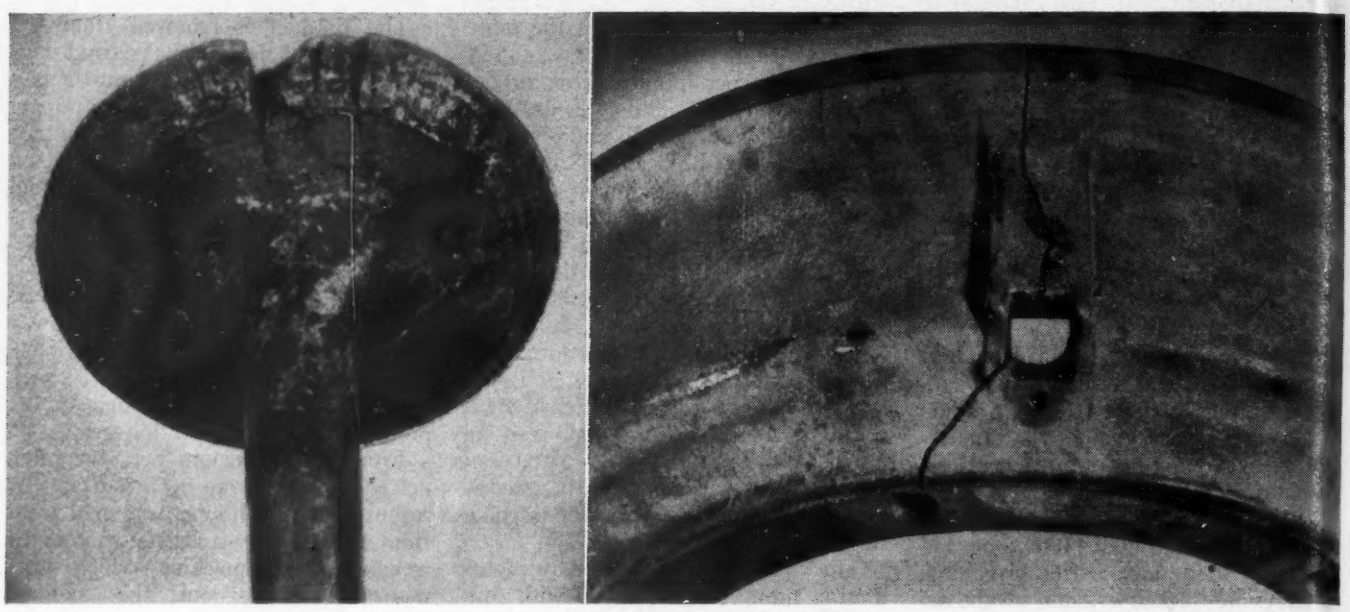


FIG. 3. Second-floor plan of the Spiegl Foods Co. dehydration plant, showing third stage of dehydration (finishing bins) and packaging department.



The valve at the left is unfit for further service because it was permitted to run without attention long after a valve grind was needed. The use of a compression gage during a routine inspection could have saved this valve. The crack in the brake drum at the right was caused by excessive heat from an improper brake shoe adjustment. Many more miles of useful service could have been gotten out of this brake drum if care had been given through routine inspection and maintenance.

Don't Let it Happen To Your Trucks

Failure to inspect trucks regularly causes costly damage to many parts, some of which may be irreplaceable. Next six months will be a critical period in food truck operation, and only the best of care will keep vehicles in service

THE next six months may be the most critical period in the history of food field motorized distribution and delivery because of the scarcity of repair parts, the inability to purchase new vehicles and the increasing shortage of mechanical labor. Only the best care will keep existing equipment running during the coming winter months when freezing weather, snow and ice add to the problems of the maintenance men in charge of motor trucks in the food industries.

Now more than ever before will preventive maintenance pay big dividends. In fact, if those in charge of food fleets do not practice preventive maintenance, they may find many vehicles in their fleets laid up indefinitely for long periods of time. And the smaller the fleet, the more serious will be the withdrawal from service of those units waiting for repair parts.

Routine Inspection First Requisite

In any adequate preventive-maintenance system, the first requisite is routine inspection. This may be as simple or as complete as the maintenance personnel will permit. It is necessary, however, to prevent trouble before it occurs. What happens when there is no routine inspection of truck engine, engine accessories, radiator, brake drums and other chassis parts is evident in the accompanying pictures.

The two views of the engine pistons show the costly effects of inadequate engine lubrication and overheating, both of which could have been avoided by some form of routine inspection.

The stuck piston rings resulted in scored cylinder and piston walls, which made necessary a complete rebuilding job that cost $200. This expense could have been avoided by an inspection that would have shown that the engine oil needed changing because it had been used too long, or because the oil filter cartridge had not been changed.

Brake drums can be cracked through excessive heat caused by improper brake shoe adjustment. This is well illustrated in the accompanying photographs. Because brake drums are becoming scarce, the inspection setup should include this important item.

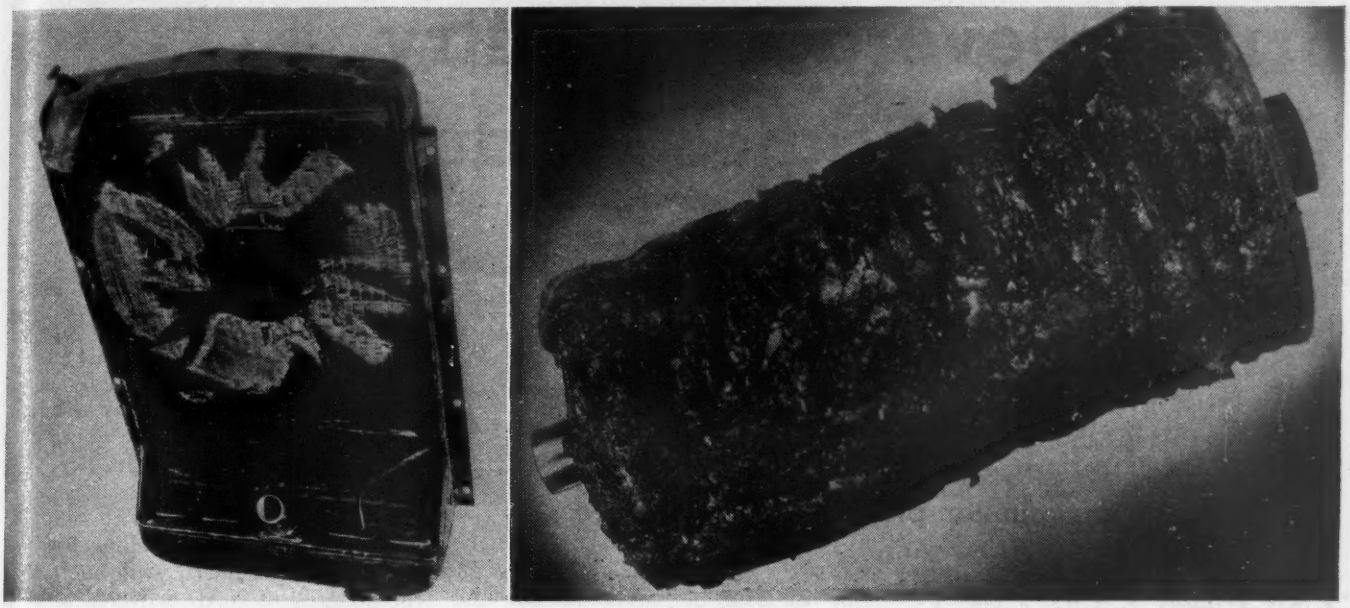
Since copper used in radiator cores is one of the most critical of all war materials, new cores are harder to get than brake drums. Radiator cores, which should last throughout the life of the truck, can be ruined by the blades of the radiator fan if the fan becomes loose.

Oil Inspection a "Must"

Since engines cannot be run without sufficient lubrication, engine oil inspection is one of the "musts" of proper preventive maintenance. This applies regardless of whether regular or detergent motor oil is used. Unless an air filter of adequate size is employed, foreign solids get into motor oil through the air drawn into the carburetor to form the combustive fuel mixture. And in some cases foreign solids get into the oil as a result of the wear of internal engine parts. Oil filters are designed to remove these foreign substances from the circulating lubricant.

Keep Oil Filters Clean

Even with detergent oils made to hold the foreign substances in suspension, oil filters are often used as an additional precaution to help keep the



A ruined radiator core, caused by gouging by the blades of the radiator fan which worked loose and moved forward, could have been avoided by the proper routine inspection. At the right is a clogged oil filter cartridge which has lost its effectiveness to clean the engine oil and prevent excessive wear of the various moving parts of the truck engine.

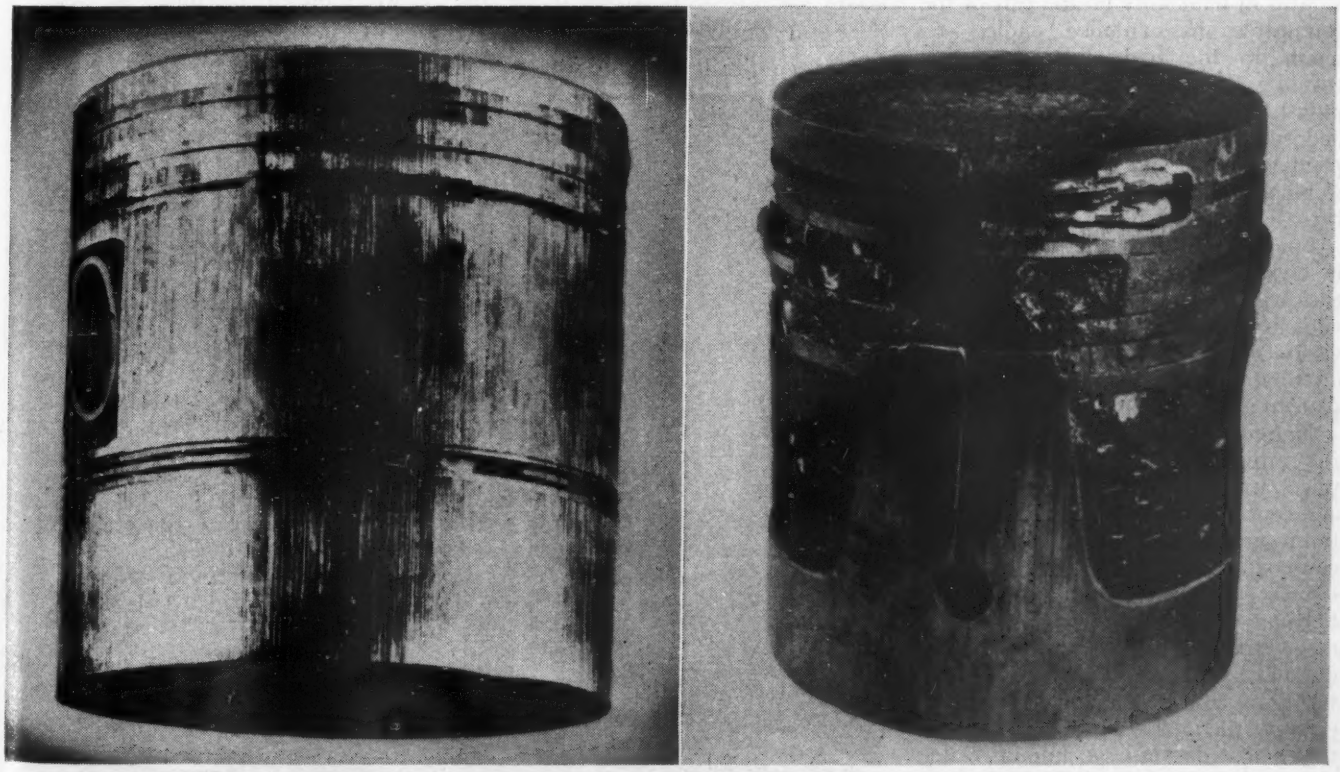
oil clean. These filters lose their effectiveness when the filtering element becomes clogged up and is not replaced in time.

When this is allowed to occur, the engine oil passages may become stopped, starving the engine of oil and resulting in its complete failure.

Oil is the cheapest item entering into motor-truck operating costs. Lack of proper oil and the essential lubrication it provides may cause costly repair. Every preventive maintenance system should provide a routine oil inspection which will keep the oil in proper condition.

Other Parts Inspected

Other parts which should be included in the inspection list are wheel bearings, spring leaves and clips, clutch, gearset, rear axle, propeller shaft and universals, and the main engine accessories—carburetor, generator, battery, distributor and starter.



Two pistons from engines whose cost of repairs could have been avoided if an adequate truck inspection had been in effect. The piston at the left has been scored beyond repair because it was run in an overheated engine resulting from a clogged radiator.

The stuck rings of the piston at the right, scored the cylinder walls so badly that the block had to be rebored—the result of faulty oil. This could have been prevented by oil change or a filter-cartridge replacement.

British Beverage Industry Consolidates Production

By J. W. TOWNS
An executive with wide experience in the British beverage industry.

Individual companies pool manpower and equipment to effect necessary wartime savings and still keep the industry in existence. How they are meeting this most difficult situation sets a pattern for industries in a similar predicament elsewhere

ON February 1, 1943, a plan for the temporary concentration of the soft drinks industry of Britain became law under an edict of the Ministry of Food, operating through a company known as the Soft Drinks Industry (Wartime) Association, Ltd. This company is controlled by a committee, with the official object of cooperation with the government in the regulation of the soft drinks industry, so long as the interests of the nation necessitate such control.

This scheme, the result of many months of hard work on the part of the committee, has entailed endless requests to the trade for information covering all aspects of the soft drinks industry. Never before has the trade had such unity, nor have the average plant executive and distributor learned so much about the industry upon which their livelihood depends.

For administrative purposes, Britain is divided into a number of regions, each with its regional director, complete with headquarters and staff, plus an advisory committee formed from local distributors. This body administers the plan to all in that area.

National standards have been fixed for recipes, labels, deposits and selling prices for a prescribed range of drinks and container sizes. In compiling them, full regard was given to the necessity for conserving raw materials for war needs —only 7.5 lb. of sugar per 10 gal. of bottling sirup, only the merest slip of a top strap for a label bearing the production unit number and the name of the drink, and strict utility in all.

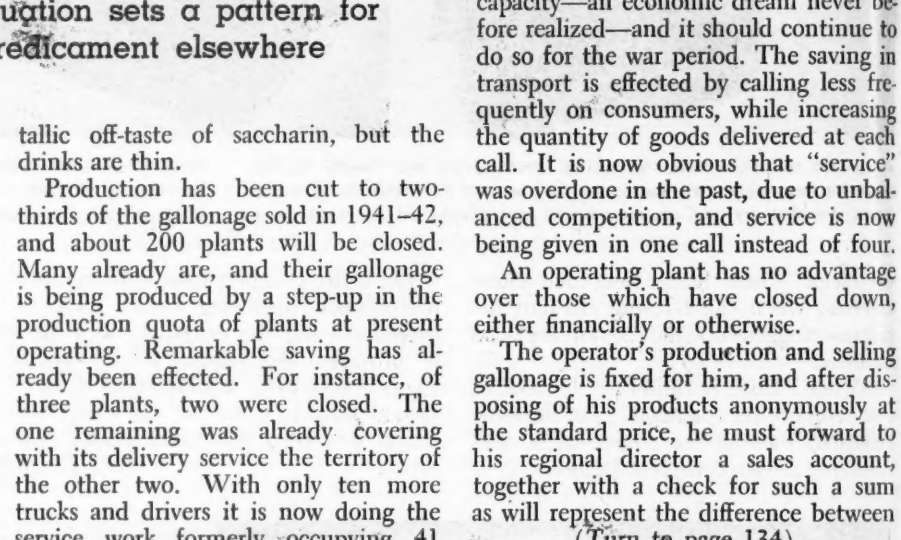
With such a low "twaddle," incorporating as it does a large amount of saccharin, there has been difficulty in keeping palatability in products. Careful manipulation of essences and other ingredients can overcome the peculiar metallic off-taste of saccharin, but the drinks are thin.

Production has been cut to two-thirds of the gallonage sold in 1941–42, and about 200 plants will be closed. Many already are, and their gallonage is being produced by a step-up in the production quota of plants at present operating. Remarkable saving has already been effected. For instance, of three plants, two were closed. The one remaining was already covering with its delivery service the territory of the other two. With only ten more trucks and drivers it is now doing the service work formerly occupying 41 trucks from the closed plants. Rubber, gasoline, manpower and factory space are all being saved for the war effort. Moreover, that plant is now running to capacity—an economic dream never before realized—and it should continue to do so for the war period. The saving in transport is effected by calling less frequently on consumers, while increasing the quantity of goods delivered at each call. It is now obvious that "service" was overdone in the past, due to unbalanced competition, and service is now being given in one call instead of four.

An operating plant has no advantage over those which have closed down, either financially or otherwise.

The operator's production and selling gallonage is fixed for him, and after disposing of his products anonymously at the standard price, he must forward to his regional director a sales account, together with a check for such a sum as will represent the difference between

(Turn to page 134)



Girl at work in a London beverage plant. Women, children and aged men are used to meet the labor shortage, and their inexperience introduces some problems.

AUTOMATIC CONTROL Of the Dehydration Processes

Automatic control is important in successful dehydration. And here is a discussion of the variables to be controlled and the instruments which are needed to do the job, with several application diagrams

By F. K. LAWLER
Managing Editor of "Food Industries"

THAT automatic control of food dehydraters is desirable is an accepted fact among the leading operators and technologists in the industry. The reason is that close control is necessary if the finished product is to meet quality specifications consistently. With most dehydration companies operating on government contracts and producing to Federal specifications, control of quality is a dollars and cents proposition. Few companies can stand the financial loss involved when large quantities of their finished product are rejected by Uncle Sam's inspectors. And in the postwar period when the industry is trying to build a market among civilian consumers, consistently good quality will be no less important than it is today. Perhaps then, too, the economy in the use of steam or fuel effected by automatic control instruments will be a worthwhile consideration as a factor in price competition, though under wartime conditions dehydraters are more interested in maximum production than in fuel economy.

Automatic control of dehydration is not new, having been applied for many years in the lumber and other industries. And while food dehydraters require different process conditions, the principles of control are the same. Actually, dehydrater control is not especially difficult because the temperature and humidity conditions of the air in the dehydrater do not change with extreme rapidity. Therefore the control system is not called upon for sudden large decreases or increases in the supply of heat or in the amount of air recirculated to keep the humidity at the desired point. But to do the job it is installed to do, a system of controls must meet definite requirements—which is to say that it must be well engineered and not be put together by amateurs. Equally important, the dehydrater itself must be a well-engineered design if the controls are to work. Automatic control cannot be expected to perform the miracle of making a dehydration unit operate satisfactorily when it never has functioned properly without controls. But given a successful unit, one correctly designed and built, instruments will manipulate it so as to give consistent and reproducible performance.

The Variables Controlled

For the most part, three process variables are controlled in the dehydration industry—temperature, relative humidity and time. Temperature should be controlled in every step of the process where it is a variable factor—lye or brine peelers, blanchers, dehydraters and finishing bins—and it ought to be controlled in each stage of a multistage dehydrater.

Control of relative humidity applies only to the dehydrater, and in practice its application varies somewhat. Several dehydration units are in operation with humidity control in all stages. But engineers and technologists who have been perfecting the technic of food dehydrater control have come to the conclusion that humidity should be controlled in the primary stage but not necessarily in the final stage. Application drawings accompanying this article show wet bulbs in the final stage, as they represent dehydraters actually in operation, but if a company must economize on instruments, that is a good place to do it. As a matter of fact, one dehydration engineer claims that humidity control in the primary stage of a two-stage compartment dryer is not necessary, as the humidity can be as low as it is possible to attain for nearly all vegetables.

In this connection a statement by Harry W. Von Losecke, in his book "Drying and Dehydration of Foods," has a bearing. He says that "In general, case-hardening is not an especially serious factor in the dehydration of vegetables, with the possible exception of potatoes and peas, but is of considerable importance in drying fruits. It is retarded by increasing the relative humidity of the air, particularly during the initial drying period, but of course this also prolongs drying."

Relative humidity control contributes to steam or fuel economy, since the less fresh, cool air taken into the system to keep the humidity low the less steam or fuel consumed to bring the cool air to the temperature of the dehydrater. Of course, if the drying time is shortened enough by a low humidity to compensate for the increased rate of steam consumption, then there is no waste of heat and the whole process is speeded up, which in itself is an economic gain. Individual operators can determine the relative importance of these factors by experiments and test runs. Meanwhile most of the leading operators believe that the primary stage of a multistage dehydrater ought to have humidity control, as should a single-stage unit. While one school of thought holds that the final stage of a two-stage unit ought to be operated at as low a relative humidity as is attainable, and therefore needs no control, one leading operator who uses finishing bins to bring the product to the final moisture content feels that while humidity control in the final stage of a tunnel dehydrater is not really necessary, it is useful during the colder months of the year when it is desirable to recirculate more of the air in the final

stage than during the warmer, more humid months.

Time should be controlled in all batch operations in the dehydration plant where it is a critical factor. Certainly batch blanchers need an automatic timer, and batch dehydraters might be equipped with a time-schedule controller which automatically lowers the temperature and preferably also the humidity as drying progresses. These time-schedule instruments consist of a clock-driven cam cut from a metal disk to the shape of the curve on a circular chart which represents the desired conditions throughout the cycle. This cam varies the control point of the controlling instrument to reproduce the desired conditions during operation.

Automatic timers, but not time-schedule controllers, are used on tunnel dehydraters where the trucks of trays are moved into the tunnel automatically at set intervals. These timers set off a series of electrically powered operations which in the desired sequence open the doors of the tunnel, move the trucks forward and one truck out the discharge end, move the new truck in and close the doors. Contact switches control the series of operations initiated by the automatic timer.

A new and very ingenious application of an automatic timer to tunnel dehydrater control has been put into practice. It is used to overcome the large temperature drop that occurs in the primary zone of the tunnel when a truck of cold trays of vegetables enters the tunnel. This drop is as much as 20 to 30 deg. F., a large portion of the total temperature drop in the entire zone. A dual temperature controller is used on the primary zone, one unit of the controller being set for a higher temperature than the other. When a cold truck enters the tunnel, the timer actuates a solenoid valve which cuts in the high-temperature controller to step up the amount of steam supplied to the heating coils and avoid a sharp temperature drop. Then after a certain portion of the time interval between truck movements, the timer cuts out the high-temperature control and puts the low-temperature unit in charge. The period during which the high-temperature unit does the controlling is adjustable to meet specific conditions.

Type of Controller Needed

As in all industrial control applications, there arises in dehydrater temperature and humidity control the question as to just how good, and therefore how expensive, a controller to install. And this question is answered in different ways by different people in the industry, depending upon their individual ideas and problems. There is the usual choice between the inexpensive and simple self-operated controllers, the comparatively inexpensive on-and-off type of instruments which utilize compressed air, hydraulic pressure or electric power controlled by relays to operate the steam valve or air damper, the throttling type of air, hydraulic or electric controllers, the throttling type with adjustable throttling range or sensitivity, and the throttling type with both adjustable sensitivity and automatic reset of the control point. And where air-operated controls are used, there is a choice between the standard diaphragm valves and damper motors or those with a positioner which overcomes friction in the valve or damper and moves it precisely to the point indicated by the position of the actuating element in the controller.

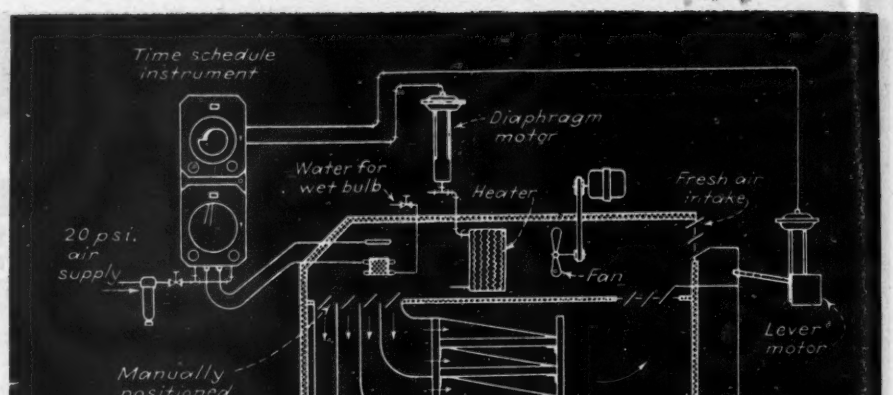


FIG. 1. Temperature, humidity and time-schedule controls for a cabinet-type dehydrater.

Self-acting controllers have not been recommended for dehydrater control because their precision in this application is not likely to be better than about plus or minus 5 deg. F., control-point adjustment is rather difficult, and no record of the temperature is made. Just how much temperature variation is permissible without damage to the product quality is open to argument, but the only safe rule is the less variation the better. One very successful operator demands an accuracy of plus or minus 2 deg. F., well within the performance of the throttling-type power-operated controllers.

Open-and-shut controllers are the simplest type of power controllers and the least expensive, and they are recommended for all industrial processes where they will do the job. But they are best suited to processes having a high heat capacity in relation to the demand and those having small time lag between the change of temperature and the detection of the change by the sensitive element of the controller. The first point is well illustrated by considering the control of temperature of a tub bath. A tub of water has a high heat capacity, and intermittent addition of hot or cold water does not change the temperature appreciably, so open-and-shut control is adequate. The air in a dehydrater, however, does not have a high heat capacity, and there is some lag due to the time it takes for the sensitive bulb to come to the same temperature as the air passing over it, air not being a very good heat carrier. And on tunnel-type dehydraters there is a sudden drop in temperature, and a sudden heat demand, when a new truck enters, as has already been pointed out. For these reasons, most dehydrators are using throttling-type controllers, which modulate the valve, or move it gradually back and forth, between the fully open and fully closed positions according to the heat demand. The type of process requiring a throttling controller can be compared to a shower bath. Here the storage volume is so small compared to the demand that intermittent addition of hot or cold water gives widely fluctuating temperatures. So a continuously open valve, as with throttling control, is necessary to give a uniform temperature.

If a dehydrater is equipped with an open-and-shut controller, the valve or damper should be set so that it is never completely closed or completely open but travels through only a portion of its range. Even then, the controller likely will shift the valve or damper back and forth almost constantly.

Assuming that the controller selected is of the throttling type, should it be equipped with a device for adjusting the throttling range, or sensitivity?

Throttling range is the number of degrees of temperature change necessary to cause the control valve to move from the fully open to the fully closed position. The consensus is that on the dehydrater an instrument with adjustable throttling range is desirable. This adjustability permits the control system to be aligned better with a particular process and give more uniform control. In some instances too high a sensitivity (too narrow a throttling range) will cause "hunting" or cycling about the control point, a condition which may be corrected by adjusting for a lower sensitivity.

Now what about automatic reset of the control point? Automatic reset is the ability of the controller to compensate for drift from the control point by gradually returning to the set control point after a large load change has occurred as when a cold truck is moved into a tunnel dehydrater. If a load change is sudden, the controlled temperature will deviate from the control point but will come back to that point at a rate dependent upon the total deviation and on the speed adjustment of the reset device. The reset is valuable for applications where the load changes are large and the process lag is great. Neither of these conditions apply in most dehydrater operations. As a result of these considerations, dehydrater control engineers believe that usually automatic reset is not necessary and that the operator might as well spare himself the expense of buying it as a feature of his controllers. Yet one of the country's leading operators is using automatic reset, both on a compartment dehydrater and a continuous tunnel type. He says, however, that it is of no particular value on the compartment unit but that though not necessary it is useful on the tunnel, especially when starting or finishing a run, when the dehydrater changes from an unloaded to a fully loaded condition and vice versa. Under these conditions it gives a more uniform temperature than would be attained without it.

Another decision which must be made in selecting controllers is whether they should be of the recording or non-recording type. On the dehydrater itself recording instruments are preferred by dehydration engineers and operators. Intelligent management can interpret the charts in light of finished product tests to great advantage. The records permit determination of the process conditions which give the right results.

Worth the Cost

Is automatic control of a dehydrater worth the cost? To answer this let us take a control system of a relatively expensive type. It is a system in operation on a compartment dehydrater and it includes wet- and dry-bulb control—temperature and humidity—and a process-schedule timer. The instruments are of the adjustable-sensitivity, throttling type and are equipped with automatic reset. The control installation cost $600, and it operates a dehydrater which cost $5,100 and has a capacity of 2,200 lb. of raw material every six hours. Whether you look at the cost of the controls as an investment to make a $5,100 dehydrater operate satisfactorily day after day, or whether you consider it as insurance on 2,200 lb. of raw material every six hours, the cost of the control is cheap.

Dehydrater Controls

To illustrate how controllers are used to regulate various types of dehydraters, several application diagrams are reproduced in these pages. To get an understanding of the operation of the controls, consider those on a simple type of dehydrater—a compartment unit—shown in Fig. 1. Here the control of the dry-bulb temperature is accomplished by modulating the valve which controls the supply of steam to the heating coil. The wet-bulb temperature is controlled by modulation of the dampers which determine the proportion of recirculated and outside air. These modulations are effected through two control mechanisms in the instrument to the left of the dehydrater. These mechanisms, actuated by the dry and wet bulbs, respectively, operate pilot valves to vary the air pressure applied to the flexible diaphragm tops of the steam valve and the damper diaphragm motor, thus operating the valve and the dampers in accordance with the deviation of the dry- and wet-bulb temperatures from the control points. The instrument is of the recording type. A time-schedule instrument is also used.

Controls for a two-zone compartment dehydrater are illustrated in Fig. 2. Here a dual dry-bulb recorder controller with a time-schedule mechanism regulates the dry-bulb temperatures in both zones by modulating valves in steam supply lines to the heaters. A wet-bulb controller with the bulb in the first zone operates the dampers controlling the recirculation of air in the system, thereby regulating the humidity.

How the temperature and humidity may be regulated in a multizone tunnel dehydrater is illustrated in Fig. 3. A wet- and dry-bulb recorder controller is used on each zone, the dry-bulb units regulating the temperature by controlling the steam valves on the heaters and the wet-bulb units controlling the humidity by positioning the dampers that regulate the recirculation of air in each zone. As mentioned previously, some operators dispense with the wet-bulb control on the second zone.

The three dehydraters shown in Figs. 1, 2 and 3 are used for vegetables. Controls for an entirely different type of dehydrater, a continuous rotary unit used for meat, are indicated in Fig. 4. Temperature only is under control here,

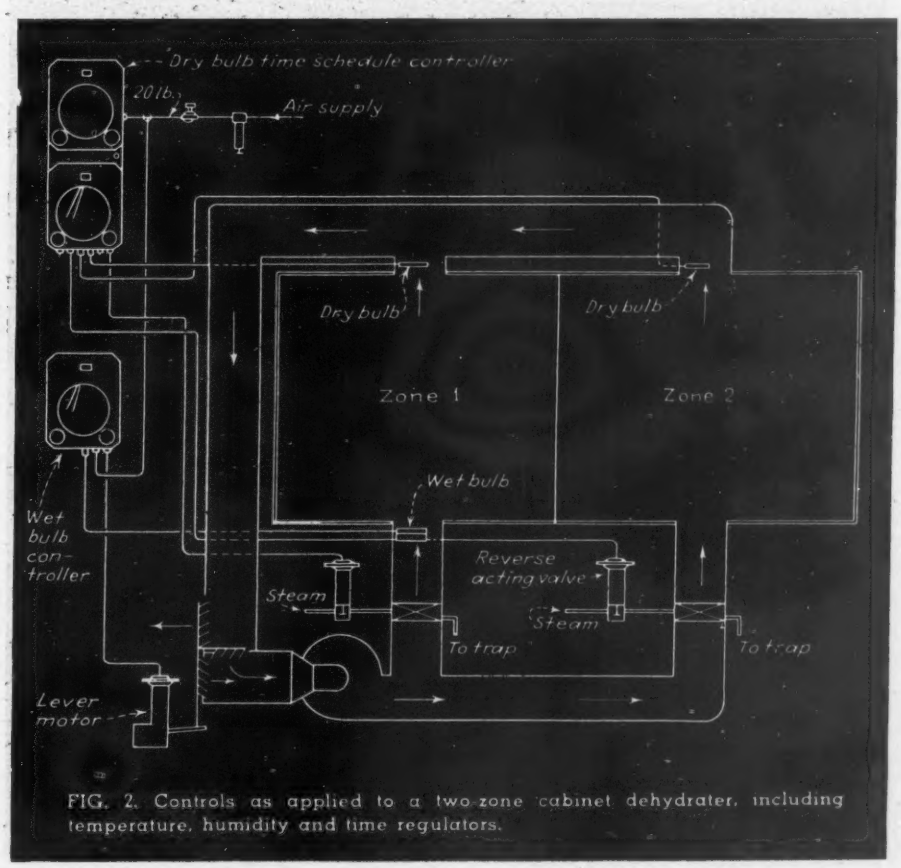


FIG. 2. Controls as applied to a two-zone cabinet dehydrater, including temperature, humidity and time regulators.

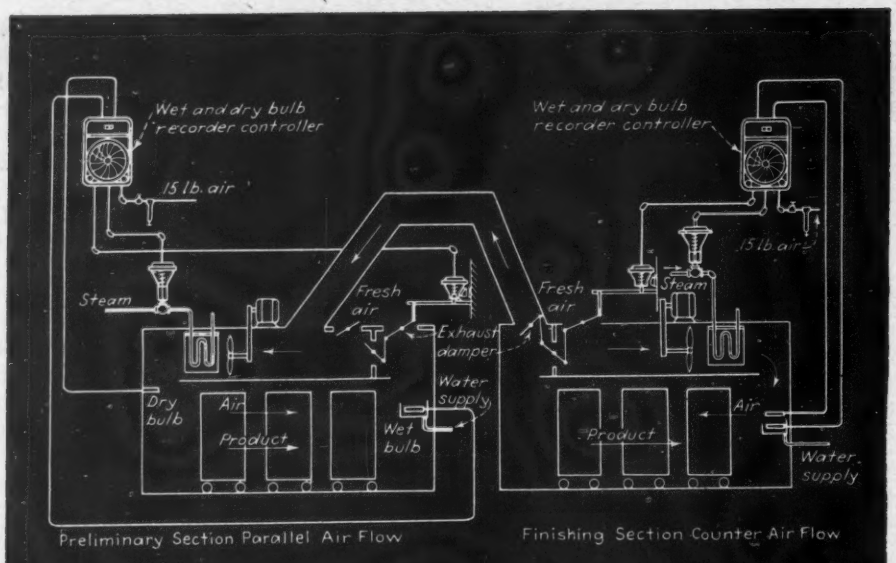


FIG. 3. Application of controls for temperature and humidity to a multi-stage tunnel dehydrater.

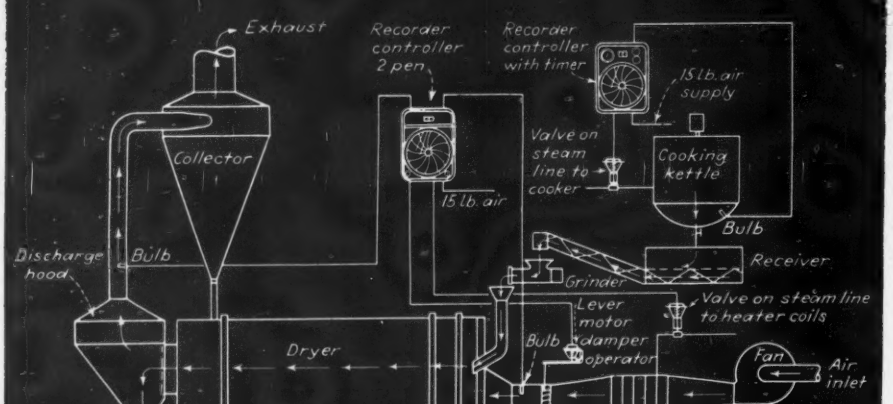


FIG. 4. Control of temperature in a continuous rotary meat dryer and in meat cooking kettle.

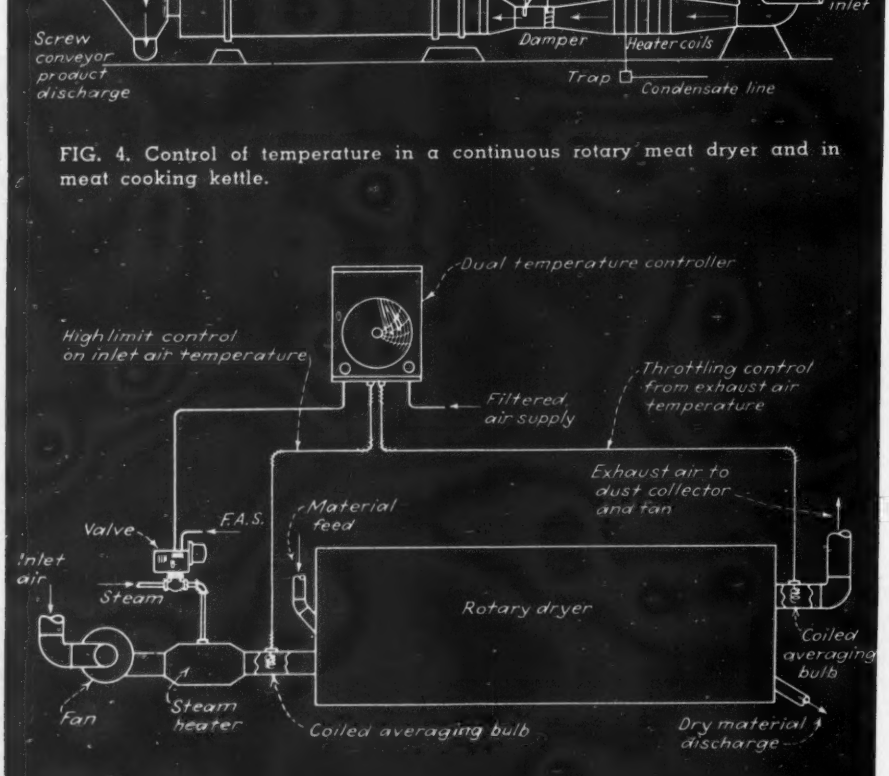


FIG. 5. Another temperature-control system for a continuous rotary dryer.

but it is controlled in both the cooking kettle and in the dehydrater. A recording controller regulates the supply of steam to the jacketed kettle and makes a record of the kettle temperature. A second recording controller, a dual unit with two bulbs, is attached to the dehydrater. One bulb is in the inlet duct between the heater and the dryer and one is in the discharge duct between the dryer and the collector. The bulb near the heater operates the heater steam valve and thus controls the temperature of the air entering the dryer. The bulb in the outlet duct operates the dampers in the inlet duct to admit more or less air to the dryer and thereby align the heat supply with the heat demand inside the dryer. If the amount of moisture evaporated in the dryer is so great that the air is cooled too much by the time it reaches the discharge end, the dampers open wider to admit more air and more heat, though at the same temperature at the inlet end. This system keeps the drying rate at the maximum without danger of scorching the meat.

Another system of controlling a rotary dryer is shown in Fig. 5. Here a dual recorder controller regulates the supply of steam to the heater. Two averaging bulbs are employed, one in the duct between the heater and the dryer and the other in the exhaust duct. This system gives high-limit control of the inlet-air temperature and throttling control for the exhaust-air temperature.

Figure 6 indicates a method of regulating the temperature in a Mojonnier egg drying unit. And this controller is an electronic unit, where those previously shown have been air-operated controllers. Heat is supplied by a gas heater, and a recorder controller with a dry bulb in the hot-air duct between the heater and the plenum chamber controls the supply of gas to the burner and hence the temperature. A recorder makes a chart of the temperature in the duct between the primary cyclone and the secondary cyclones, while a flame controller operates a valve in the gas supply line to shut off the supply when there is no flame at the burner and thus avoid the collection of gas in the dryer and an explosion upon subsequent ignition.

Air-operated control for a Barnhill egg dryer is diagrammed in Fig. 7. This is a recorder controller with wet and dry bulbs, but only the dry-bulb temperature is controlled. The controller modulates the valve in the gas line supplying fuel to the gas heater.

Figure 8 indicates the control used in a Douthitt milk drying system. In this application the temperature of the milk in the final heater is regulated. The bulb is in the outlet of the heater and the controller modulates the valve in the steam line to the heater.

Another milk dryer control, that on a Rogers dryer, uses not only temperature control but pressure regulation (Fig. 9). The pressure instrument controls and records the absolute pressure in the evaporator. One of the temperature instruments controls and records the temperature of the milk as it goes to the process tank from which it is pumped to the sprays in the drying chamber, this controller regulating the supply of steam to the heater. The other temperature instrument, a single-duty double-record reset instrument, controls the temperature of the air in the drying chamber by regulating the supply of steam to the heater. This instrument also records the temperatures in the inlet and exhaust of the drying chamber.

To show an instrumentation application on a compartment vegetable dryer more complete than anything encountered in commercial practice, Fig. 10 diagrams the control system designed for use in the Eastern Regional Research Laboratory experimental work. In this application a wet and dry bulb recorder controller regulates the temperature and humidity in the drying chamber by controlling the supply of steam to the heater and by positioning the dampers controlling the recirculation of air and the valve controlling the steam humidifier. The controlling dry bulb is on the heater side of the trays, but a second dry bulb is located on the other side for recording the temperature there.

The use of a steam type humidifier is not shown in any of the other applications illustrated. This system is so arranged that the valve in the steam humidifier line is closed when the dampers are opening to lower the humidity by increasing the intake of fresh air, otherwise the two humidity controls would be operating against each other. Another feature of this application is that a positioner is used on the damper motor to overcome friction.

Yet another special arrangement in this control system is the use of two valves on the steam supply line of the heater. One of these is a needle valve and the other a ¾-in. valve, these being in parallel. The range of air pressure required to operate the needle valve is 2 to 10 lb., that of the other valve, 9 to 17 lb. This means that the needle valve opens first as steam is needed to raise the temperature, and if the flow does not meet the heat requirements, the big valve opens as the temperature drops further. This gives uniform control without large surges of heat. Another auxiliary of the system is a solenoid valve in the air-supply line, this being wired in parallel with the holding coil on the fan starter, so that if the fan is stopped, the system shuts down completely.

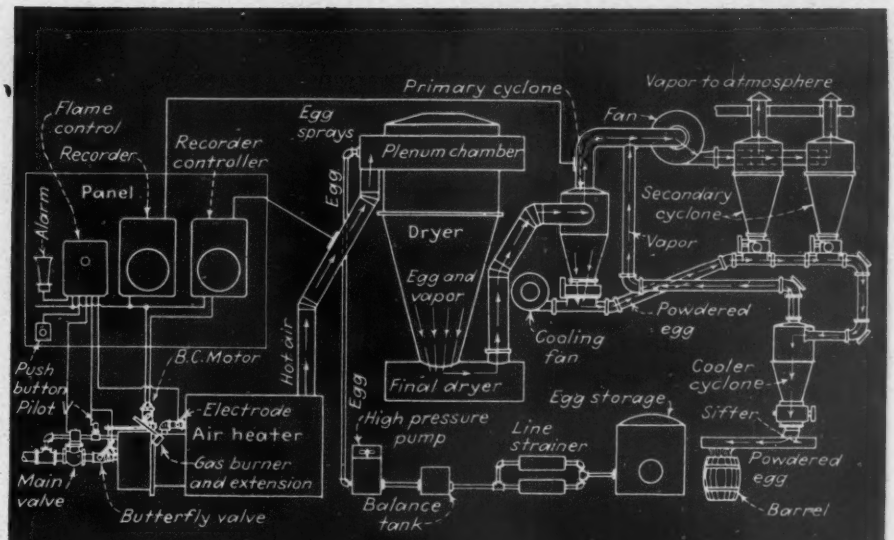


FIG. 6. System for controlling the temperature in a gas-fired Mojonnier egg dryer, with a flame-control unit to prevent explosion.

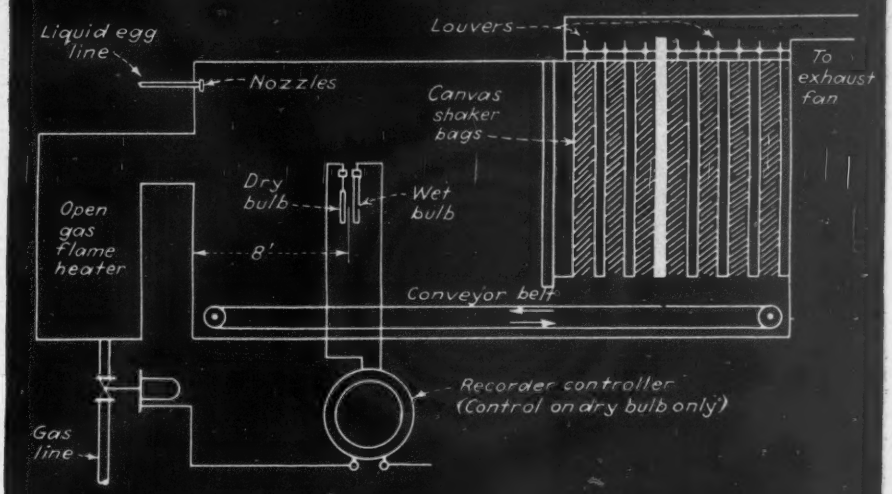


FIG. 7. Temperature control and humidity recorder as used on a Barnhill egg dehydrater.

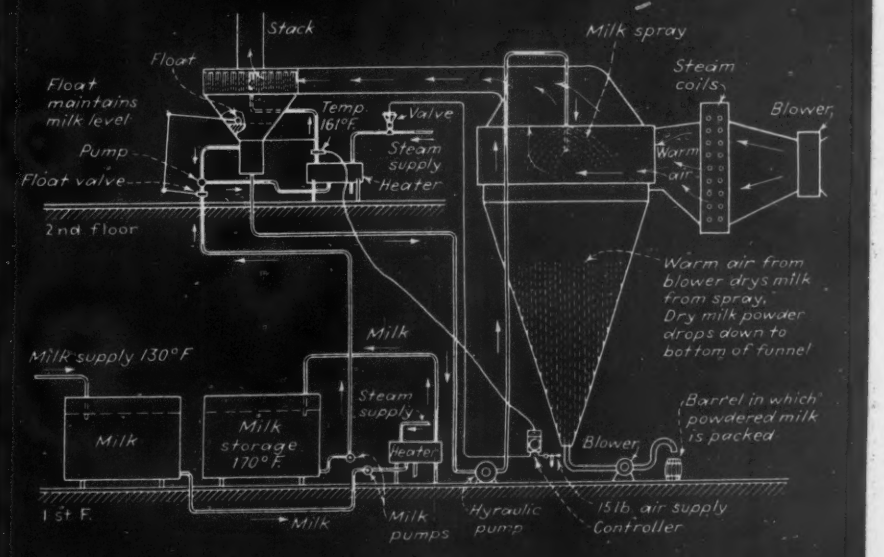


FIG. 8. Temperature control as applied to a Douthitt milk drying system.

Peeler Controls

So far the control applications illustrated have applied to dehydraters of one type or another. But Fig. 11 is a control system as applied to a lye peeler and which can also be used with a brine peeler in a dehydration plant. An indicating controller operates a steam valve to control the temperature of the solution in the peeler. A recording controller, as recommended for dehydraters, is not necessary on this application, but accurate control of temperature is important for best results. Here is one application in a dehydration plant when an open-and-shut type of controller will work because of the high heat capacity of the process. And a self-acting controller probably would give close enough temperature regulation.

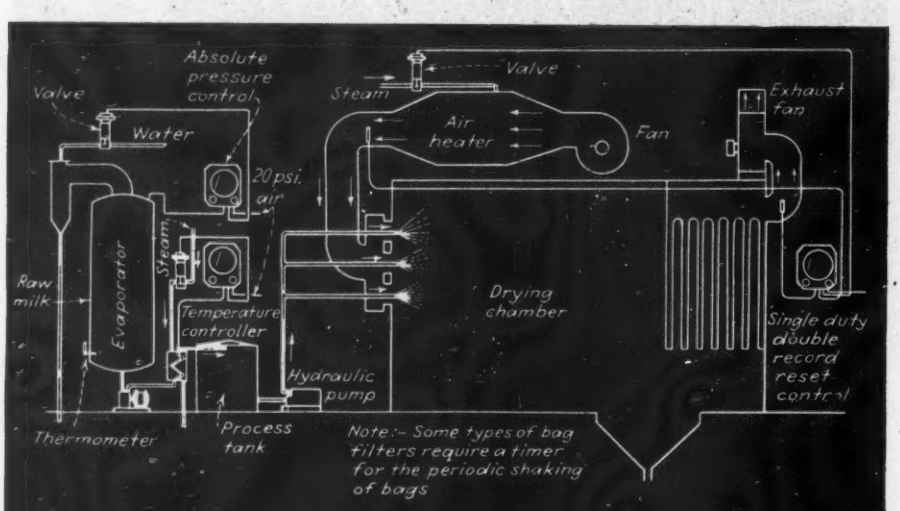


FIG. 9. Both temperature and pressure controls are used to regulate this Rogers milk dryer, temperature being controlled at two points.

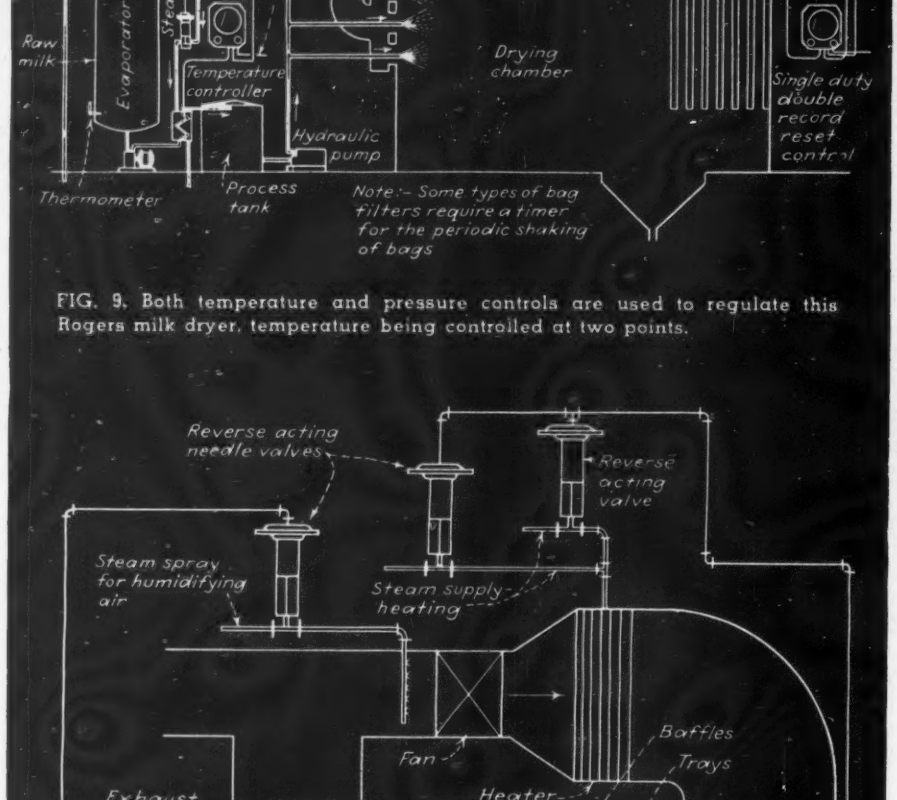


FIG. 10. Designed for very close regulation in experimental work, this control system for a cabinet dehydrater is more complex than used in commercial operation.

Control of Blancher

Now we come to an operation in the dehydration plant which needs as close control as possible because of the critical nature of the process. We refer to blanching. As one operator has expressed it, if a product has not been reduced to the specified moisture content, it can be dehydrated some more and therefore saved. But if the government inspectors in checking a finished product dehydrated for Army or Lend-Lease find that the blanching was inadequate, it is too late to do anything about it and the product is lost.

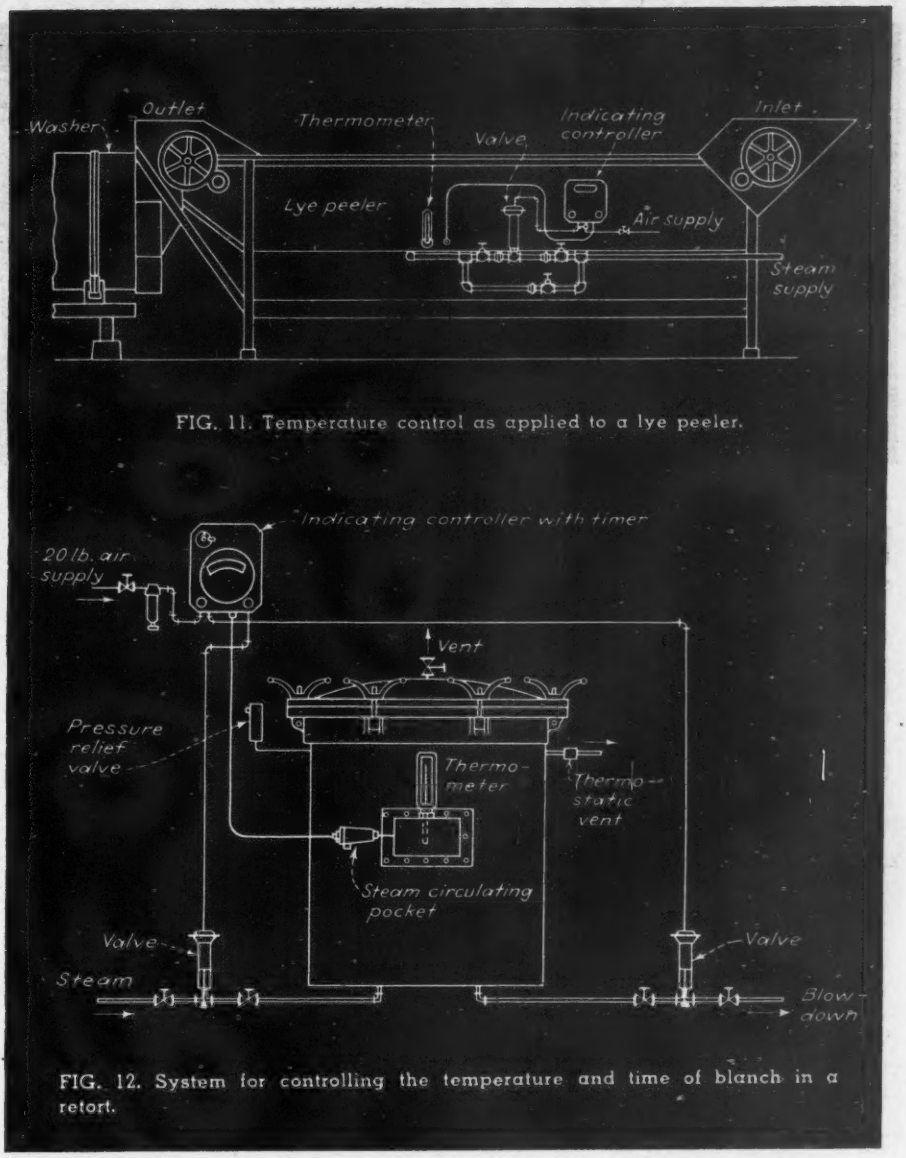
Pressure steam blanching, as done in a retort, lends itself to automatic control of both time and temperature, and such an application is shown in Fig. 12. Here an indicating controller regulates the amount of steam supplied to the blancher, and hence the temperature. But temperature control is not enough. The time of blanching is just as critical as the temperature. So this controller has a timer attachment, which doesn't start timing until the temperature has come up to the control point. Then at the end of the set period, the timer causes the controller to close the steam valve and open a blow-down valve to stop the blanch quickly and permit the retort to be opened. This retort is vented by thermostatic valves to let the air out as the steam comes in and avoid air pockets where the temperature will be below the desired level. These valves remain open and let the air pass, but when the steam strikes them as the air is exhausted they close and hold the steam in the retort.

It is questionable whether automatic control can be applied to an atmospheric pressure cabinet blancher or a continuous box or hump-back blancher operating at atmospheric pressure. No such applications have come to the attention of Food Industries editors. It seems that operators use the flow of steam from the vents of these blanchers to indicate that the blancher is full of steam and therefore the temperature is that of steam at atmospheric pressure. However, thermometers should be placed at various points along the blancher so that heat conditions can be checked quickly and easily.*

Hot water blanchers, not recommended by U. S. dehydration technologists for most products, can be controlled easily by the same system as

* If any dehydrator has had experience with automatic control of these blanchers, the editors of *Food Industries* would appreciate comment on how it was done and what results were obtained.

shown for lye peeler in Fig. 11. It may be advisable to use two steam lines to heat such a blancher, one for each end of the blancher, with a separate control for each. The need for two steam supply pipes lies in the fact that at the receiving end there is a much higher heat load due to the cold product. By the time the product reaches the discharge end, it is at the temperature of the water and the heat demand is low. Incidentally, an on-and-off controller could be used on a water blancher, as well as on a lye or brine peeler, because the heat capacity of the liquid is very great in relation to the heat demand. And a self-acting controller might give fairly satisfactory results.



Finishing-bin Control

Temperature control on finishing bins, which have come into use as a means of equalizing the moisture content of the product and bringing it down to the specified percentage without too long operation of the dehydrater, requires only an indicating dry-bulb controller. No record is necessary in this operation. As indicated in Fig. 13, control is attained by locating the bulb in the hot air duct between the heater and the bins and modulating the valve in the line supplying steam to the heater. Humidity control is of no value here, because the air should be as dry as it is possible to obtain. Chemical desiccators may be utilized to dehydrate the air, and cooling coils might be used for the same purpose, but humidity control is not practiced as it is in the dehydrater itself.

Some Important Considerations

There are several factors which might be called minor but which must be taken into consideration in dehydrater control if the system is to work satisfactorily. These include the location of the sensitive bulbs, care of the wet-bulb wick, selection of valve, damper and heater sizes and proper trapping of the condensate from the heater coils.

Successful control of dehydraters requires a sensitive bulb with a large surface area because of the low heat conductivity of the air with which the bulb must reach a temperature equilibrium. A satisfactory element is the preformed coiled capillary bulb. And the bulb must be located well in the air stream but must be away from any source of direct heat radiation, such as a steam pipe or heater. A bulb can be shielded from radiation, but the shield must be so placed that it does not impede air circulation over the bulb.

Since there is a temperature differential between the air inlet and exhaust ends of a dehydrater, the question arises as to what is the proper location for the dry bulb. There seems to be a preference for installing the bulb at the hot end of the dehydrater to guard against exceeding the maximum permissible temperature and scorching the product. But if proper allowance is made for the temperature differential in setting the controller, it makes little difference where the bulb is located with respect to the hot and cool ends of the process. The wet bulb is often placed at the exhaust end, but actually it may be located wherever most convenient.

Wet-Bulb Problems

The wet bulb involves many special problems, and many dehydration plant operators would be surprised to learn that their relative humidities are not always what they seem. In the first place, the air velocity over the bulb must be reasonably high—about 600 ft. a minute—to eliminate errors due to radiation from the surroundings, which are at dry bulb temperature. Yet the velocity must not be so high as to evaporate the water from the bulb surface faster than it is supplied, resulting in a partially wetted bulb and too high a wet-bulb reading. Such a condition can be corrected by baffling. Wet-bulb errors of as great as 10 deg. F. are said by one engineer to occur if the water supply to the wet bulb approaches dry-bulb temperature. To avoid this, a system has been devised for feeding the water from outside the dehydrator to the wet-bulb wicks through a coiled copper tube surrounded by a wet wick so as to bring the water to the wet-bulb temperature.

Yet another possible error in the wet-bulb reading—also of the order of several degrees—is that due to heat conduction along the capillary tube. This is eliminated by the proper use of metals of poor heat conductivity in the construction of the tube system, by mounting the bulb in nonconducting clamps or bushings so that a minimum of heat flows to the bulb from the supports, and by exposing as little of the wet-bulb capillary to the dry-bulb temperature as possible by having only the bulb extend into the drying chamber. In event some of the capillary must be inside, 3 or 4 in. of it may be covered with a wetted wick such as is used on the wet bulb.

Water is usually applied to the bulb

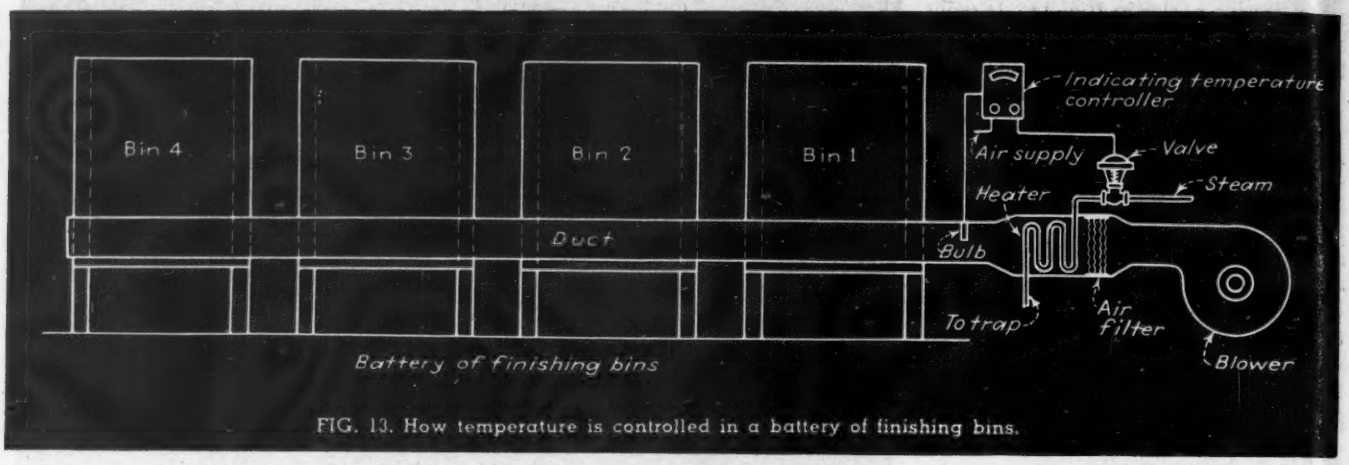


FIG. 13. How temperature is controlled in a battery of finishing bins.

either by a cloth wick or a porous sleeve. Either is capable of accurate results if certain precautions are observed.

If a wick is used it should be clean and carefully smoothed out on the bulb after wetting so that it is in contact with the entire surface of the bulb and bulb neck. Neglect to do this can introduce an error of as much as 4 percent of the true wet-bulb depression.

As to the type of wick material to use, that is best left to the instrument supplier, but if it is necessary to make up a wick in the field, a soft rather thick cotton toweling ought to be employed. Napped fabrics are to be avoided. The bulb ought to be horizontal, and the wick must dip well into a water cistern which is fully as long as the wick and which maintains the water surface at a point about 1 in. below the bottom of the bulb.

If a porous sleeve is used, it is ideal for the incoming water to be at the wet-bulb temperature when it reaches the bulb. If it is warmer or colder the wet-bulb readings will be affected by the rate of flow. The wick feed is somewhat less critical than that of the porous sleeve in this respect, since the water tends to come to the equilibrium temperature as it moves up the wick.

Wicks Must Be Changed

Wet bulb sleeves or wicks ought to be changed and cleaned frequently—one well-known dehydrator changes the wicks every day. This is necessary if accurate wet bulb readings and close humidity control are to be had. Wet bulbs rapidly collect particles of foreign material from the air stream, and if hard water is used the solids in the water deposit on the bulb wick or sleeve as evaporation occurs. The latter can lead to a very large error, and one which is subject to wide variations.

The use of distilled water or rain water for wet bulbs is advisable, as it prevents the deposition of solids from the water. Otherwise the wicks or sleeves must be cleaned at regular intervals to remove the deposit. Dilute hydrochloric acid is effective in removing most of the deposits due to impure water. Its application ought to be followed by rinsing in dilute alkali and clean water.

Valves, Dampers, Coils

Wet bulbs are by no means the only source of unexpected difficulty in what appears to be a well-engineered dehydrater control system. A control valve which is oversize makes for poor control because the valve always works with the disk very close to the seat so that a small movement of the disk gives a large change in flow. Oversize dampers are unsatisfactory for a similar reason.

Another possible source of dehydrater control trouble is a steam trap which does not effectively remove the condensate from the heater coils. There are a couple of true trap stories which illustrate what is meant. One is the case of the food processor—who ought to have known better—who put two controls and two valves on two heaters, then spoiled his good work by hooking both heaters to the same trap. The other story is about a well-engineered dehydrater which refused to operate properly despite all attempts to bring it into line. An instrument engineer found the trouble in an unexpected place. A steam trap on the heater coil had been raised to clear an obstruction that was in the way when it was installed, and it was higher than the bottom third of the coil. Condensate sometimes backed up in the coil until only two-thirds of the heating surface was available. And, of course, the controls couldn't make the dehydrater toe the line because there wasn't enough heat supply to meet the demands made on the system.

Another point about heater coils is that the heating surface should not be too much oversize. If it is, the coil may at some time in the cycle need to be operated at less than atmospheric pressure. If the condensate removal device remains effective under this condition, there will be no deviation from the control point when this occurs. But if condensate accumulates in the coil for a time and is then discharged as a slug when the steam valve opens wider, the excess heating surface will suddenly become available and cause the temperature to overshoot. One remedy is to shut off some of the heating surface by means of manual valves. Another is to provide for vacuum removal of the condensate.

Even the best of dehydraters with the most perfect controls will be a disappointment to its operator if there is not available in the plant enough boiler capacity to meet the peak steam demands of the dehydrater. And as to boiler capacity, more than one dehydration plant operator has jumped to conclusions. A dehydrater with a certain capacity per hour of a certain product will require so many pounds of steam an hour—and no less. If the boiler can't produce this steam, then the dehydrater can't produce results.

It is perhaps unfortunate to conclude this discussion with so long a commentary on dehydrater troubles, lest the reader come to the conclusion that no control system will work satisfactorily. But by paying heed to the possibilities of trouble, one can avoid the pitfalls. And in regard to whether the controls will give satisfaction, the dehydration industry is full of operators who would as soon shut their plants down as try to operate them without the aid of any automatic control instruments.

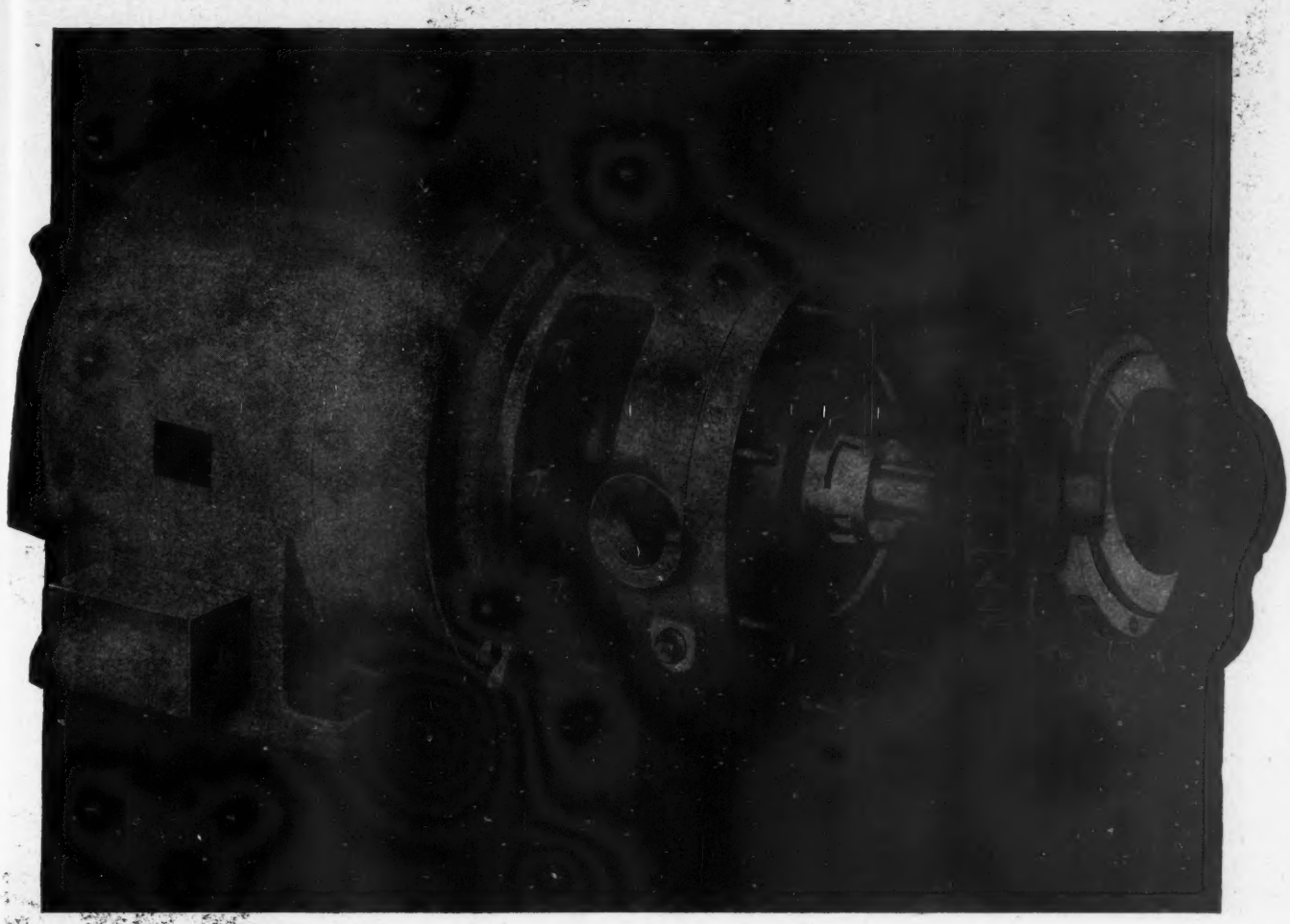
Acknowledgment

In concluding, we should like to give credit to the manufacturers of industrial instruments for supplying most of the information and application drawings contained in this article. Figures 1, 2, 9, 10 and 11 are from application drawings furnished by Taylor Instrument Cos., Rochester, N. Y. Figures 3, 4 and 8 were supplied by the Bristol Co., Waterbury, Conn. Figure 5 was furnished by the Brown Instrument Co., Philadelphia. Figure 6 is from Wheelco Instruments Co., Chicago, Ill. Figure 7 is from the Foxboro Co., Foxboro, Mass.

NASH CLEAN-AIR COMPRESSORS

(TRADE MARK REG.)

are Long Life compressors, because they have no internal wearing parts



The Nash Clean-Air Compressor has but one moving part, cast in one piece and rotating in the pump casing without metallic contact. No internal lubrication is necessary; therefore air or other gas compressed with a Nash is entirely free from oil contamination.

Dust and heat are removed from the air, or gas compressed, by the unique Nash "Liquid Piston". Air from a Nash Compressor is therefore delivered free from dust, heat, or oil, without supplementary filters or air washers, in a perfected mechanical structure with no internal wearing parts.

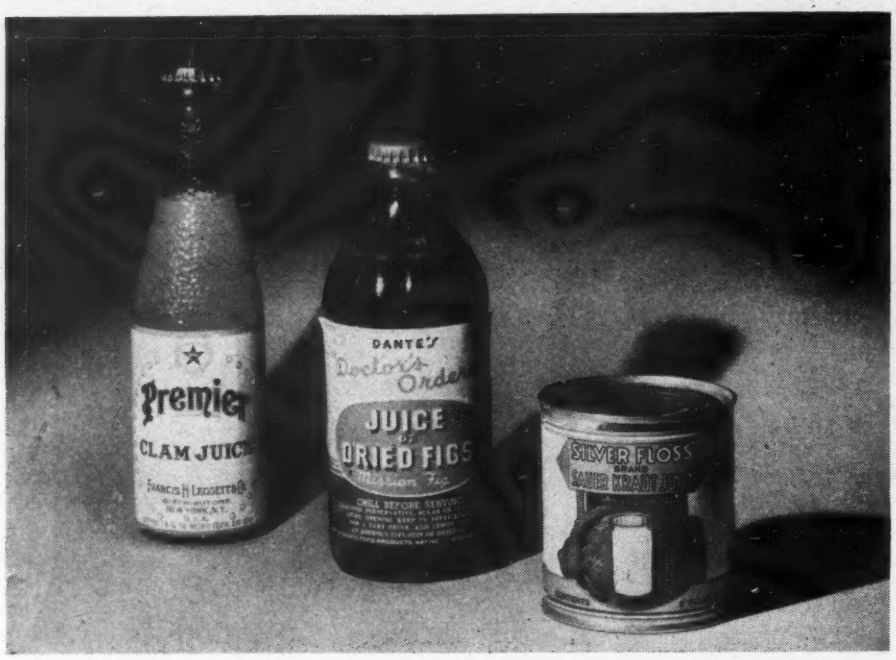
Air or gas from a Nash Compressor may be used for agitating, blending, maintaining pressure on storage tanks, or moving liquids and materials by pressure displacement, in connection with the most delicate food, beverage, or chemical process, without danger of contamination.

Bulletin D-252 tells all about Nash Clean-Air Compressors, and it is free on request.

THE NASH ENGINEERING COMPANY

220 WILSON ROAD, SOUTH NORWALK, CONNECTICUT, U. S. A.

NEW PACKAGES & PRODUCTS



Three New Juices

To supplement the rapidly dwindling stocks of tomato and grapefruit juice, many retailers are stocking up on a variety of juices that have not frequently been seen on the market. Among these, sauerkraut juice, clam juice and the juice of dried figs are now appearing on the grocers' shelves. Empire State Pickling Co., Phelps, N. Y., is packing "Silver Floss" sauerkraut juice in a 9-oz. can—the juice is to be served iced before meals.

"Premier" clam juice, distributed by Francis H. Leggett & Co., New York, N. Y., can be used as a flavoring in soups or bouillon, or as a cocktail with the addition of lemon, tomato catsup, tabasco sauce and celery salt. Juice of dried figs is a new drink processed by Dante Food Products, Chicago, Ill., from mission figs with no added preservative, sugar or flavoring. If a tart taste is desired, lemon juice may be added to the drink, which is served cold.

Lipton Makes Another

BRINGING its excellent technic of processing dried and dehydrated foods to yet another soup mixture, Continental Foods, Inc., Hoboken, N. J., has introduced "Lipton's Black Bean Soup." Containing black beans (scientifically precooked and powdered), salt, hydrogenated vegetable oil, dehydrated tomatoes, cornstarch, vegetable protein derivative (artificial seasoning), spices, dehydrated onion and garlic and citric acid, the soup is ready to boil with the addition of water, and serve with lemon, egg slices or sherry. Continental is packing the black bean soup in 3⅞-oz. packages, three to a carton.

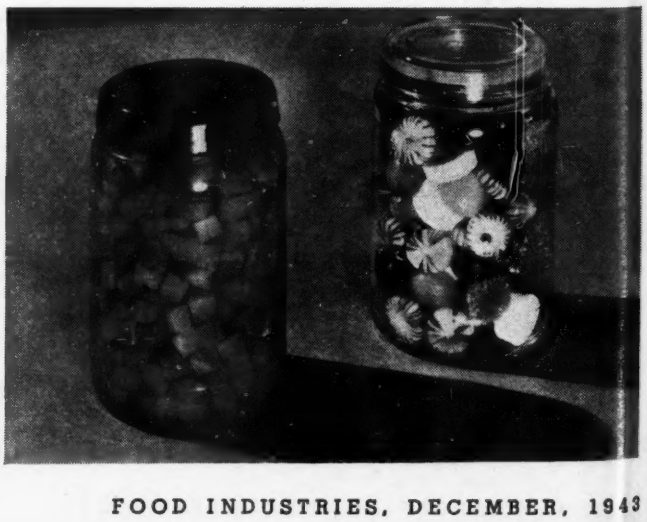
"Glascan" Developed

DEVELOPMENT of a new food container has been reported by Hartford-Empire Co., Hartford, Conn. Named "Glascan," the new container is capped with glass instead of metal and has a non-rubber gasket. Company technicians predict that it will enable the government to release much critical rubber and metals for use in military equipment.

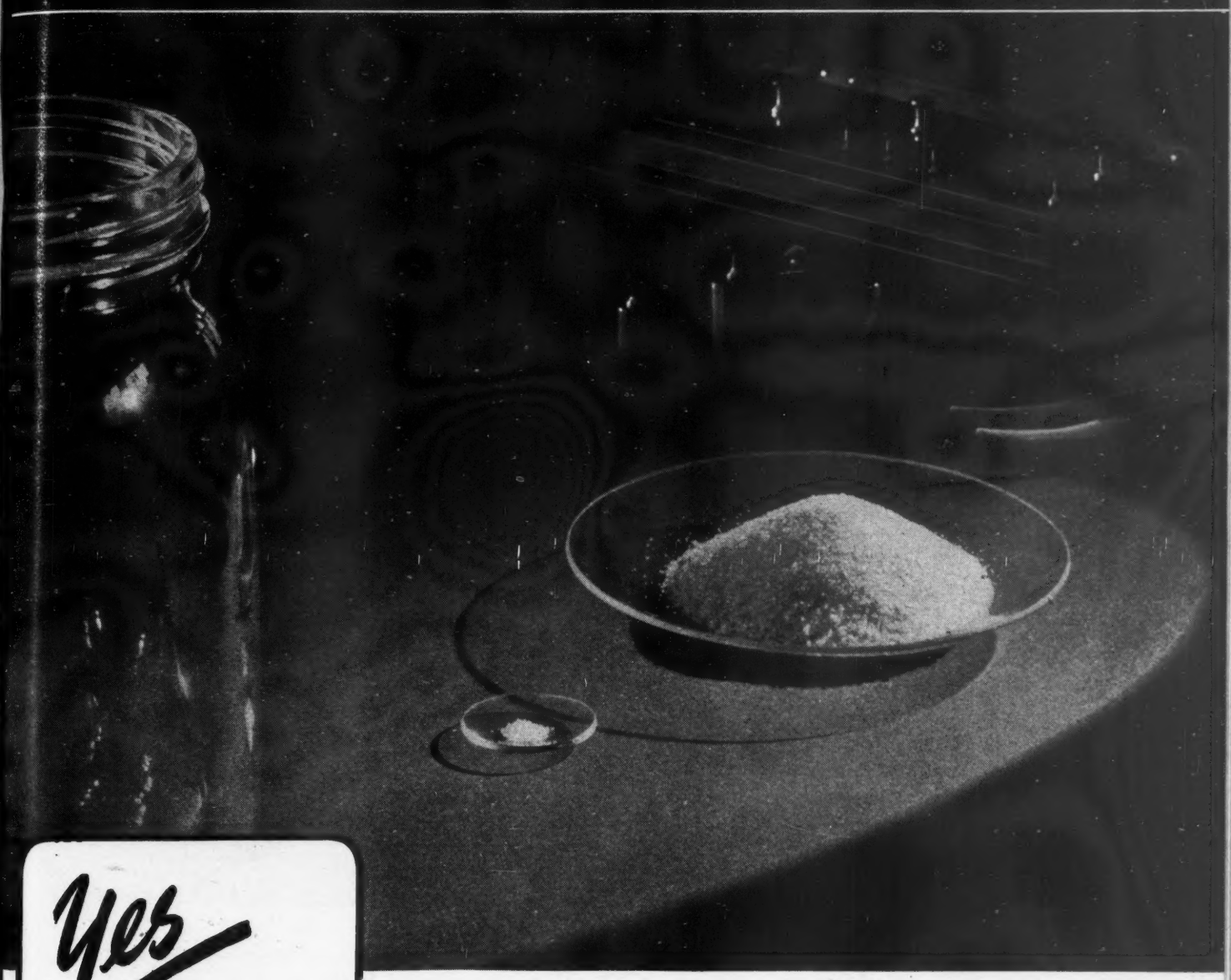
The container is the result of two years' research by the company. In addition to the glass problems involved, more than 1,400 formulas were made up in seeking a suitable rubber substitute. As a wartime contribution, Hartford-Empire has offered the design to the glass industry without charge. Several food packing companies are experimenting with the new container.

Apricot Kernels

CHOCOLATE-FLAVORED "Aprikernels" packed by Gordon-Donohue & Co., Detroit, Mich., are now marketed for use in baked goods and desserts or as topping on pastries, ice cream and pud-



1 PART IN 2000 MAKES IT CLEAR



Yes THERE'S A DIFFERENCE IN GLASS

YOU may find it hard to believe that any ingredient of fine glassware must be measured in a quantity as small as *five one-hundredths of one per cent* of the entire batch. But it's true. For instance, as little as one pound of one material in a ton of glass can make that glass decidedly clearer, brighter, more brilliant.

Such careful measurement means that the production of fine glass depends, among other things, on fine, accurate control over the ingredients. As a rule, any of today's commercial glassware will have the clarity and brilliance you expect. You can take for granted that its ingredients have been weighed and mixed with care.

But the fact that only one pound of one ingredient in 2000 pounds of glass means better ware is important to you because it proves a point—the point that there can be, and often is, a *difference in glass.*

The difference is made up of things that are little in themselves —such things as composition, thermal shock resistance, brilliance, clarity, toughness. When added together, they can make the big difference in the containers you buy, the difference between ordinary glass and top-quality glass.

That difference is important.

The skill and care that go into the making of Armstrong's Glass are pictorially described in our new booklet, "Men and Glass." For your free copy, drop a postcard to Armstrong Cork Co., Glass and Closure Division, 4212 Prince St., Lancaster, Pa.

ARMSTRONG'S GLASS

and **ARMSTRONG'S CLOSURES**

THE housewife who's mixing this salad won't have any difficulty remembering what brand of salad oil and dressing she used . . . and liked. For these two metal caps spell out their name and brand for her every time she sees them.

The next time she goes shopping, lithographed Armstrong's Metal Caps will be on the job, catching her eye, striking the familiar note that helps ring up repeat sales.

Why not give your packages the added recognition and remembrance value of lithographed Armstrong's Metal Caps? The cost of adding this extra sales-appeal to your packages is surprisingly low. Send us a sample of your present container and label. We'll send you a sample cap design, and a quotation. No obligation, of course.

Our experience as glass container producers is also at your service, to help you with any wartime glass packaging problem. Write to Armstrong Cork Company, Glass and Closure Division, 4212 Prince Street, Lancaster, Pa.

The Army-Navy "E" and Star have been awarded to the men and women of Armstrong's Closure and Floor Division Plants for excellence in the production of such war materials as cartridge cases, shells, bombs, and camouflage netting.

Armstrong's Closures

TURN STANDARD CONTAINERS INTO STANDOUT PACKAGES

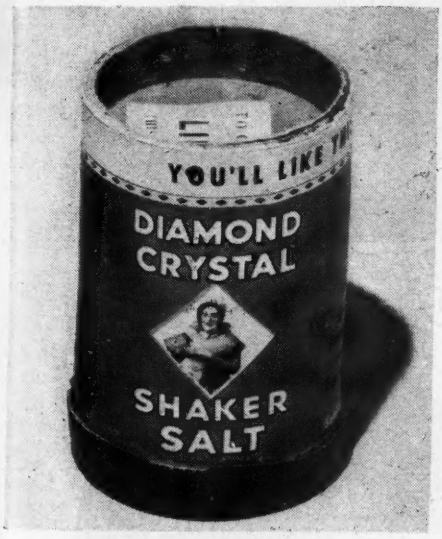
dings. One of the "extras" that distinguish good cookery, the Aprikernels contain sugar, sweet almonds, apricot kernels, soya flour, artificial flavor and U. S. certified color.

Tastes Like Pretzels

A FURTHER aid to hostesses for cocktail parties and the like are "Pretzel Bitz" packed by Specialty Development Co., Bluffton, Ind. Ingredients are shortening, salt, malt, wheat flour, leavening and dextrose. Tasting exactly like pretzels but shaped like tiny pellets or nuts, the Pretzel Bitz are packed in a 5-oz. lithographed cellophane bag.

Trial Size

DIAMOND CRYSTAL SALT CO., INC., St. Clair, Mich., is using a clever merchandising scheme to promote its product. A small replica of the well-known red and yellow package, 2¼ in. high, is being offered as an introductory sample in metropolitan stores, with other food purchases. An inverted paperboard cap

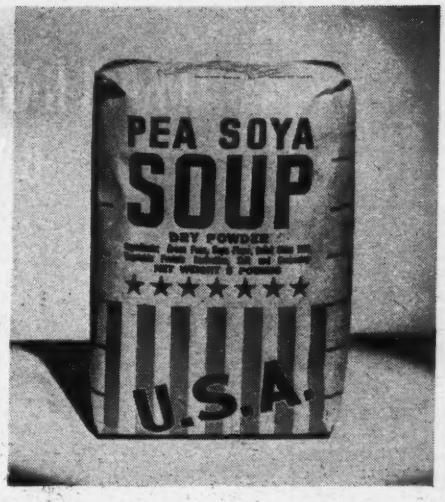


lifts out to show a paperboard shaker top, and the 2-oz. package keeps product identification.

It's Going Over

DRY soup mix is now shipped overseas in 5-lb. delta-seal kraft bags, designed to save cargo space. Pea-soya dry soup mix, used for feeding the armed forces and civilians of liberated nations regarded as one of the most economical and nutritious relief foods, is packed in a sturdy bag with a simple two-color design. Instructions for preparation of the soup are printed in 15 different foreign languages.

Each kraft bag is placed in a double 450 MST cellophane bag and heat-sealed. Nine 5-lb. units are sewn in a heavy cotton bag; this is put in a multi-



wall Bemis bag, which is sealed with a Jonflex cloth tape manufactured by Industrial Tape Corp. Maximum storage is assured by a new gassing process developed by Dow Chemical Co.

Spread for Bread

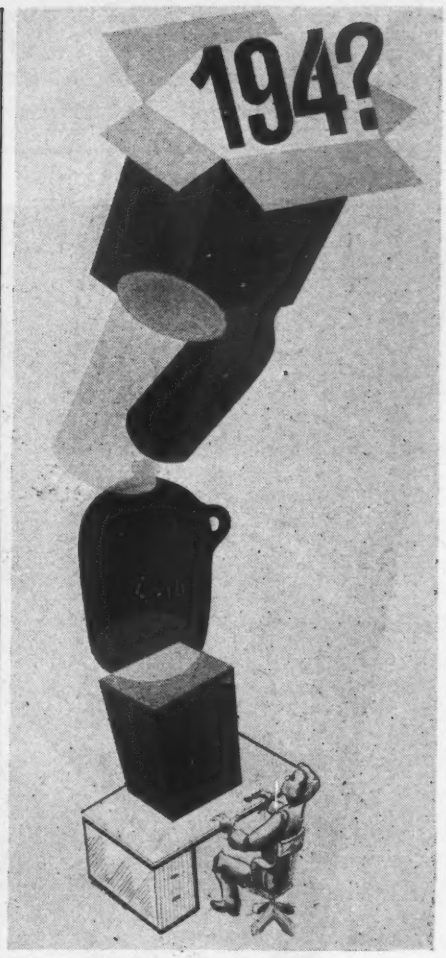
"DYNE" a dairy spread that can pinch-hit for butter, has been offered to Madison (Wis.) housewives by the Wisconsin Alumni Research Foundation, who plan to market the product nationally in the near future. The spread was developed by members of the staff of the Dairy Industries Division, College of Agriculture. It is unsalted, uncolored, closely resembling cream cheese. "Dyne" contains cream, milk, cultured buttermilk, lactic acid and salt; the formula is approximately 30 percent butterfat, 20 percent milk solids not fat and the balance moisture. It is creamier than butter and has a milk color.

The University Foundation will license reputable and suitably equipped processors and permit them to use the collective trademark "Dyne."

Collapsible Egg Case

COLLAPSIBLE fiberboard egg cases with high reuse value have been designed and patented by Roy C. Potts Associates, Washington, D. C. Already in use by Southern States Marketing Association, the container is an answer to WPB's recent order that eggs and citrus fruits be packed in fiberboard.

Features of the containers are of interest to both packers and shippers. It may be constructed of either solid fiberboard or corrugated board, it is easy to set up or to collapse, it is returnable and reusable, when collapsed it occupies less than one-sixth of the space of the set-up case, the saving in weight results in more economical transportation, interlocking cleats on the surface of the case prevent slipping, the container is readily opened for examination, and it is a complete unit with no additional stapling or pasting required.



LOOKING AHEAD...

No merchandiser is fooled by the ease with which his product sells nowadays. Abnormal conditions are always temporary. That tough Buyer's Market may be just around the corner.

Buying habits are being formed today as always. Mrs. Consumer, whether consciously or unconsciously, continues to make a bee-line for Quality—and Quality is unmistakably typified by a distinctive, appetite-whetting package.

The Rossotti organization offers you a completely integrated service on fine Labels, Package Wraps and Folding Cartons—from sketch to finished product. Complete Art, Idea, and Merchandising Counsel.

Why not call in a Rossotti Packaging Man for a constructive discussion of your individual requirements? Or drop us a line at our North Bergen Plant. No obligation at any time.

ROSSOTTI LITHOGRAPHING COMPANY, INC.
NORTH BERGEN, NEW JERSEY

West Coast Division
Rossotti West Coast Lithographing Corporation
San Francisco, Cal.

Sales Representatives in Principal Cities

MAKING VITAMINS BY THE TONS

Every day, *production at Roche Park supplies enough B_1 ... and B_2 (riboflavin) ... to fill several hundred freight cars with flour enriched to the new Food & Drug Administration standards which became effective October 1st.*

Write to Roche Park for a copy of our Vitamin Manual and a copy of the Food & Drug Administration statement of policy discussing restoration and fortification of foods. Vitamin costs today are lower than ever. Prepare now for the tougher competition that lies ahead.

ROCHE

Vitamin Division, HOFFMANN-LA ROCHE, INC.,
Roche Park, Nutley 10, New Jersey

Processors Analyze Present And Future Problems

GMA takes stock of wartime predicaments of food manufacturers and looks to postwar planning

MEMBERS of Grocery Manufacturers of America spent three days, November 3 to 5, at the Waldorf Astoria Hotel, New York, taking stock of the present and trading experiences in preparing for the resumption of normal business. W. W. Robbins, of General Foods Sales Corp., warned of a new attitude of mind toward sales work as revealed by 5,574 interviews of factory workers at Servel, Inc.—of 123 former salesmen, only 61 expressed a desire to return to selling. Offsetting this indicated attitude was the fact that among the 5,574 employees interviewed there were 122 who formerly had operated their own businesses, yet 203 expressed a desire to enter business on their own account when the war is over. The latter attitude was considered reassuring of the continuance of the spirit of individual enterprise.

In an executive session the GMA discussed postwar planning, selective distribution, grade labeling and the need for informing employees and organized consumer groups on this complex subject, the paper shortage and container problems. Jean Carroll and Walter Straub, now of OPA, gave an inside picture of reforms in OPA and indicated that a statement would soon be issued on how and why and within what limits OPA operates.

Paul S. Willis, president of GMA, reviewed the food industry's contribution to the war effort. He deplored the failure of Washington to realize the essentiality of food, both in the war effort and on the home front, and called for prompt relief for the food manufacturer from the squeeze between rising costs and ceiling prices.

Multiple Management Succeeds

Thomas R. Reid, of McCormick & Co., told of his company's ten-year experience with the multiple-management plan. It has been a huge success, resulting in the creation of three junior boards of directors. These are the office workers', factory workers' and salesmen's junior boards. In the first five years of the office workers' junior board 2,709 new ideas were approved and passed to the senior board of directors, which in turn approved and put into effect all but six. Two important effects of this technic of drawing on the combined intelligence of a large organization are that net corporate earnings were maintained throughout the depression, and at a large union meeting in Baltimore the officials publicly admitted that McCormick had already done more for its employees than any union could expect to gain in their behalf.

Paul S. Willis, president of GMA

Pointers on Labor

How manufacturers in a No. 1 critical area cooperated to solve the shortage of manpower was described by W. W. Paddon, manager of the Dayton, Ohio, plant of Loose-Wiles Biscuit Co. This classification was leading to diversion of war work elsewhere, and cut-backs and cancellations of war contracts were imminent. Cooperative policies designed to force more effective utilization of labor in cost-plus manufacture were installed and saved the day, with the result that Dayton was reclassified as a No. 2 critical area. Mr. Paddon urged all food manufacturers to get acquainted with WMC area officials as well as USES, and he advised all to attend the meetings of each group and emphasize the essentiality of the food industry.

Prisoners of war can be used in food plants, said F. W. Hunter, of WMC, provided that there are any prisoners near enough, but they may not be used in direct contact with food. Imported labor to the number of 50,000 was used in 1943, but Congressional action restricted them to agricultural work. It is hoped Congress will permit a wider scope of work in 1944. Women, Mr. Hunter pointed out, constitute the major unused source of factory employees, despite the fact that 15,000,000 were so employed in 1943.

Transportation Cut Needed

Mark Upson, now in charge of transportation in the War Food Administration, warned that the next six months will constitute a critical period in rail and truck transportation. Joseph Eastman, of ODT, has said that the worst is yet to come. The food industry is expected to develop plans in cooperation with WFA to cut rail traffic in 1944 by 10 percent of its 1943 ton-miles. Failure to attain the needed reduction will require rationing of shipping, elimination of cross-hauling and a general upset of the distribution programs of many national food distributors. Each corporation president is urged to check up regularly on his company's plans to conserve transportation.

M. Lee Marshall, of Continental Baking Co., formerly in charge of the Office of Materials and Facilities in WFA, reviewed the changes and improvements in that function and introduced J. W. Millard, his successor. Mr. Millard warned that there will be a shortage of containers of all sorts in 1944, although the supply will be adequate for essential needs. He urged continuation of the search for substitutes and methods of reuse.

E. A. ("Woody") Meyers, chief of the Industry Operative Branch of WFA, said that the importance of food was at last recognized in Washington, but that the delay in announcing the 1944 program is disappointing. As a member of the Postwar Committee of WFA, he finds that the food industry today is no more prepared for peace than we were for war before Pearl Harbor.

Advice on Postwar Planning

William Todd, of G. A. Hormel & Co., introduced as the vice-president in charge of Day-After-Tomorrow, told of Hormel's efforts at postwar planning. He said that the term "postwar planning" is the hallucination of an unbalanced mind and should be replaced by

something relating to postwar jobs—but jobs can be created only when there are more sales. The end of the war will bring more changes than ordinarily happen in a short period. In peace we may face more economic hardships and sacrifices than war has brought to us. Hormel's plan is to develop as many approved projects as possible, these to be instituted as soon as practicable after the victory is won.

Subsidies Opposed

Chester Bowles, Administrator of OPA, made an eloquent plea for food subsidies. But GMA turned him down by a resolution opposing subsidies as unsound and requiring payment of the subsidy plus its administrative costs.

Fred Sexauer, of Dairymen's League Cooperative Association, denounced subsidies as inflationary. He also denounced OPA, WMC, SS, ODT, WFA and all agencies that are "interfering" with the farmers' efforts to produce more food in accordance with the nation's needs.

Three Postwar Restraints

C. W. Dunn, counsel for GMA, named three important trade restraints to be faced in the postwar era, urging opposition to each on every possible occasion: The restraints are (1) private-brand competition, (2) farmer cooperative manufacturing, (3) grade labeling. But Mr. Dunn found the industry in a sound economic condition and the outlook otherwise favorable. He urged the creation of a foundation to study food economics, something paralleling the Nutrition Foundation.

Sir John Boyd Orr, of Aberdeen, Scotland, who has been in active charge of British nutrition during the war, was awarded the GMA Scientific Award of Distinction by a two-way radio hook-up contributed by General Foods Corp. In acknowledging the award, Sir John asked for the fullest support and cooperation in furthering the United Nations food plan to banish hunger and malnutrition from the postwar world. He predicted a great prosperity for agriculture that would overflow into other industries and bring about an expanding world economy.

A. C. Nielsen presented his customary graphic analysis of what has occurred in the distribution of food in 1943. Of the changes that have taken place, he said, the changes in age groups in the population is of far more importance than the geographic redistribution of consumers as a result of wartime employment. Small groceries are doing far better than might be expected, partly because of the restrictions on the use of gasoline and because of coupon rationing.

Paul S. Willis was reelected president of GMA.

Roosevelt Asks Congress To Pass UNRRA Funds

FOLLOWING the UNRRA agreement signed at the White House by 44 nations on November 9, President Roosevelt asked Congress to enact a bill authorizing the appropriation of funds for United States participation in the rehabilitation program. Spokesmen at the Atlantic City conference indicated that the United States' share in the program may approximate $1,500,000,000, of which the first appropriation may be expected to total not more than $500,000,000 and possibly less. It is expected that a large portion of the UNRRA funds contributed by the United States will be spent for food products for relief in war-torn areas and liberated nations.

Food, Nutrition Board Adopts Resolution

AT a recent meeting of the Food and Nutrition Board, National Research Council, the following important resolution was adopted:

"In view of the reduced supply of animal proteins available within the United States for civilian use during the war emergency, the Food and Nutrition Board of the National Research Council considers it advisable that the use for human food of vegetable proteins of superior biological value should be encouraged and stimulated by opening all reasonable avenues for such use. Vegetable sources rich in protein of high quality include soybeans, peanuts, corn germ, wheat germ, and yeast. To varying degrees, they have the merit of supplementing the proteins of the endosperms of cereal grains with certain amino acids in which the latter are more or less deficient.

While these protein sources are not equally adaptable to all of the following purposes, each has merit for one or more of them and their possibilities should be explored thoroughly. This exploration should include their distribution through commercial channels. The purposes for which they should be explored are:

1. Special food dishes or recipes designed to produce attractive home blends.
2. Incorporation in standard breads or specialty breads. For this purpose, proportions of less than 3 percent of the wheat flour used are regarded as furnishing too little superior protein to be of significant nutritional service. There are experimental data demonstrating that 5 percent exert significant supplementing effects on the proteins of wheat flour. For purposes of use in commercial bakeries, either in bread or other bakery products, it is of major importance that the special protein sources, such as soya flour, should become available in highly standardized grades so that their per-

Harris & Ewing

INVESTIGATES FOOD SUBSIDIES

Senator Ellison D. (Cotton Ed.) Smith of South Carolina, and his Senate Agriculture Committee, on November 15 began an investigation of what Senator Smith considers the nation's number one evil—food price subsidies. The picture shows the crowded committee room with Senators around the table listening to Joe G. Montague, general counsel of the Texas and Southwestern Cattle Raisers Association. Montague testified against subsidies.

DIRECTS SUGAR RESEARCH

Dr. Robert C. Hockett has been named scientific director of Sugar Research Foundation, Inc., a fact-finding group organized by the sugar industry. Prior to joining the Foundation, Dr. Hockett was associate professor of organic chemistry at Massachusetts Institute of Technology. He is an international authority on carbohydrates, particularly the chemistry of sugars.

formance in doughs is fully predictable. This fact should be brought to the attention of the producers of these products.

3. Incorporation in meat products as extenders.

In order to fulfill these purposes, no restrictions to such use in bread of these superior vegetable protein sources should be imposed in any regulations that may be issued setting standards of identity for bread during the period of the emergency.

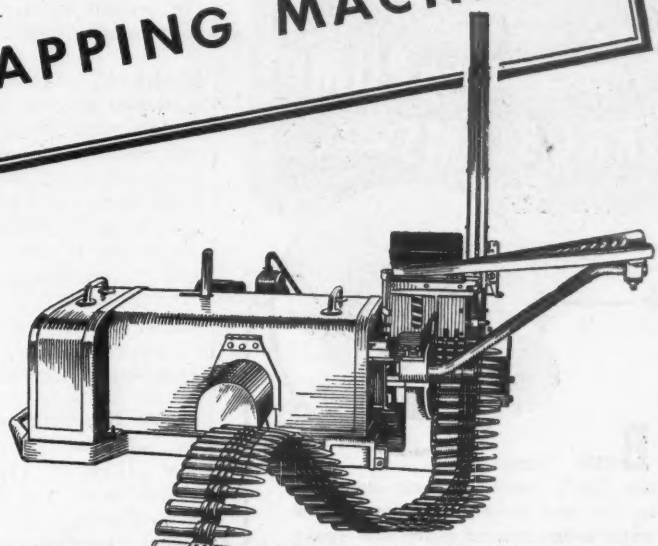
Further, encouragement should be given to increasing the use of high protein vegetable products in commercial meat products insofar as this is practicable.

Fisheries Treaty Proposed

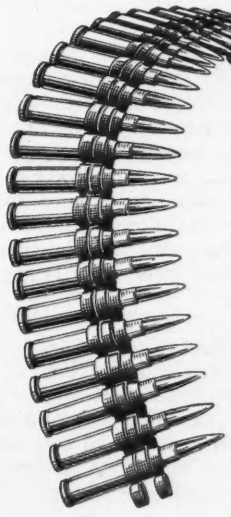
ESTABLISHMENT of a salmon fisheries treaty between Canada and the United States as a substitute for the Pacific Salmon Fisheries Bill now before Congress has been proposed by the Seattle Chamber of Commerce. The bill would give this country jurisdiction over salmon fishing in the Pacific Ocean south of the 50th parallel—including Canadian waters without consideration of Canada's rights, a chamber resolution said.

"It is certain to either cause diplomatic disputes or create discrimination," the resolution declared. "Extension of authority to the International Fisheries Commission to establish a treaty is the soundest answer to the offshore fisheries problem."

There may be an idea here for a better WRAPPING MACHINE



LINKS 150 CARTRIDGES PER MINUTE



When the war ends, you'll expect wrapping machines that embody new and advanced ideas... You'll be most likely to get them from an organization that has kept its wits sharp and its skill at top notch by building not only wrapping machines, but new and intricate armament machines as well.

50-cal. machine gun bullets, for example, are linked at a speed of 150 per minute by a new machine of our invention and manufacture which has proved so successful that hundreds are now serving the armed forces. Portable, comparatively light in weight and operated by power or by hand, this machine can follow the fighting and be used in the most advanced positions.

Other machines built by us are used for piercing and priming cartridges, loading them with powder and projectile, inserting them into clips, packing them into cartons, etc.

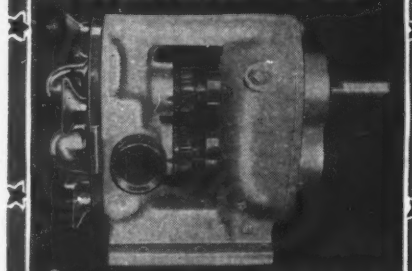
The inventive talent, engineering ability and craftsmanship required for this type of work will lead to faster, more efficient and more versatile wrapping machines. *We are ready now to study your postwar wrapping plans.*

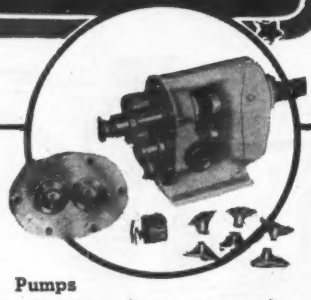
SPRINGFIELD, MASS. NEW YORK CHICAGO CLEVELAND LOS ANGELES TORONTO

PACKAGE MACHINERY COMPANY

Over a Quarter Billion Packages per day are wrapped on our Machines

Solve your WARTIME FOOD-Processing PUMP PROBLEMS—





BUMP Pumps are 100% sanitary—long approved by the food processing industry. Few parts to be cleaned (note how easily dissembled for c'eaning). Bump Pumps are positive displacement type pumps that operate at slow speeds . . . are self-priming under high vacuums or against head pressures . . . delivers a constant volume per revolution without churning action or agitation within the pump. Thin, viscous, hot or cold liquids, or solid-bearing liquids can be successfully pumped . . . no contamination of liquid being pumped, as bearings are entirely separate from pump's chamber. Complete details upon request.

USED FOR PUMPING

Canned Foods	Salad Dressings	Tomato Juice
Citrus Juice	Ground Meat	Baby Foods
Oils and Fats	Milk	Mayonnaize
Dog Food	Beer	Ice Cream
Cheese	Acids	Syrup
Fudge	Vine and	Vinegar
Crushed Fruit	Grapes	Liquor
Chocolate	Cream	Eggs
Yeast Malt		

CAPACITIES from ONE to 300 GALLONS per MINUTE!

TAKE CARE OF THE PUMPS YOU NOW HAVE!

The BUMP PUMP CO.
LA CROSSE ★ WISCONSIN

OPA Price Regulations

Mincemeat—A method by which processors of mincemeat can determine their maximum prices on the basis of recently announced apple prices and increases for other ingredients and packaging materials was announced November 1 by OPA. Amendment 11 to MPR 262 provided a method which will give an increase of about 1 cent a pound at the processor level and about 1½ cents in the amount which the housewife will pay for the delicacy over going prices.

Pickles—All pickles and piccalilli were given maximum prices at levels up to, but not including, wholesale and retail in a new MPR 488 effective November 2. The new maximums reflect higher ingredient costs and will mean about 1 cent more in the retail price of a quart jar of pickles. The new regulation covers sales of salt stock, brine and processed pickles, finger pepper, cherry pepper, cauliflower, onions and pepper hulls, genuine dill pickles and piccalilli.

Hamburger—To end the practice of selling low-grade hamburger as Type 3 breakfast sausage by some members of the trade, OPA on November 3 revised its legal definition and pricing of Type 3 breakfast sausage. Amendment 9 to MPR 389 requires this type of sausage to be made with pork as the major ingredient and no more than two other meats or meat products as minor ingredients and with no detached beef fat.

Processed Turkey—Increases in maximum base prices for processed turkeys, made necessary by increased farm prices which processors have to pay for the live birds, were established on October 30 in amendment 7 to MPR 422 and amendment 8 to MPR 423. The action adds from ½ to 3 cents per pound to the price of dressed turkeys at retail. The order mainly affects dressed, kosher-killed and kosher-dressed and plucked turkeys.

Frozen Boneless Beef—The list of maximum prices for frozen boneless beef, all of which goes to the armed forces, was extended late in October through the pricing of such of this beef as is derived only from the hindquarters of steers and heifers of choice, good or commercial grades. The prices established by amendment 32 to RMPR 169 are set on a dollars-per-hundred weight basis, in line with those which have prevailed previously for frozen boneless beef.

Poultry—On November 4 OPA revised its definition and labeling provisions for frozen eviscerated poultry, meeting what the industry said were its normal standards. According to amendment 18 to RMPR 269, each bird must be placed in a freezer within six hours after evisceration, and must be kept at freezing temperatures until frozen solid.

Salmon—Acting on the basis of new information received from fishermen, unions, packers and other persons connected with the salmon industry, OPA recently advanced the ex-vessel (fishermen's) maximum price for fall or chum salmon 1½ cents a pound. Given in amendment 15 to MPR 418, the increase is from 3½ to 5 cents per pound for salmon caught in the Columbia River area and from 3 to 4½ cents for salmon caught elsewhere in Washington and Oregon waters. It is effective during the period September to December.

Butter—Three principal changes in the regulation controlling the price of butter were made in amendment 22 to MPR 289 issued by OPA on November 4. One reduced the wholesaler's margins and introduced new provisions discouraging disruptive market practices which had arisen in recent months. The second modified the allowances for bulk butter packed in wooden tubs, and the third change reduced the maximum prices of unsalted butter by ¾ cent per pound.

Bakery Products—Manufacturers of cakes, pies, doughnuts, fruitcake, pastry and sweet yeast-raised products must calculate and report to OPA district offices their prices on any product before offering it for sale, according to OPA edict of November 8. Amendment 7 to MPR 319 makes it plain that the calculation and reporting before sale were necessary whether the product was on the market when the regulation became effective or whether it came on the market later.

Army Rations—In line with action it had taken previously on other Army rations, OPA on November 7 exempted from price control the new Army Field Ration known as "Ten-in-One." Rations have generally been exempted from price control. The action was taken through amendment 34 to RSR No. 1 to GMPR.

Edible Tree Nuts—All edible tree nuts were brought under price control for the first time on October 30 in a manner which should bring savings of at least 10 cents per pound to the ultimate consumer and ease a "squeeze" on food processors such as bakers and confectioners. The four most important domestic nuts—walnuts, filberts, almonds and pecans—are affected by MPR 490.

Shrimp and Prawn—Specific cents-per-pound maximum prices for sales of frozen shrimp and prawn at the processor level were revised on November 3 in line with the prices recently established for fresh shrimp and prawn. According to amendment 7 to MPR 364, the maximum price set for frozen headless shrimp and prawn, with a count of 21 to 25 to the pound, is raised from 27 to 28 cents per pound, and the maximum price for frozen peeled veined shrimp and prawn, with a count of 20 to 27 to the pound, is raised from 37½ to 40½ cents per pound.

Sauerkraut—A method by which processors will establish maximum prices for canned and barreled sauerkraut manufactured from the 1943 cabbage crop for sales to civilians and to government procurement agencies was supplied late in October in amendment 18 to MPR 306. Most of the pack is expected to be purchased by the government.

Sugar—Beet sugar processors will no longer be required to set aside a portion of their monthly production for delivery at the direction of OPA, according to an amendment to RO 3, issued October 27. The improved shipping situation with respect to imports of cane sugar makes it unnecessary to withhold a portion of the beet sugar crop for delivery.

Used Beverage Bottles—Moving to restore normal channeling of used beer and malt beverage bottles to brewers and to halt price increases by inducing normal functioning of the trades' deposit and refund system, OPA on October 26 established nation-wide dollars-and-cents ceilings over all sizes and types of used beer bottles, in amendment 42 to Revised SR 14.

Soft Wheat—Sales of soft wheat by producers and all other distributors in 34 states east of the Rocky Mountains were placed under specific ceilings on November 1, in MPR 487. The maximum price established at the leading terminal markets of Chicago and St. Louis will be $1.66 a bushel when the commission man's charge of 1½ cents per bushel is included.

Hog and Pork Cuts—To make the lower priced regular cut of pork loin from which pork chops are derived more readily available to consumers, OPA on November 2 issued amendment 12 to RMPR 148, prohibiting the sale to retailers of the higher-priced boneless pork loin, fresh, frozen or cured. This was done by changing the definition of boneless loin in the maximum price regulation.

Shell Eggs—Maximum prices for wholesale grades of shell eggs were given by OPA on October 30 for each week up to the week beginning Dec. 27, 1943. Amendment 17 to MPR 333 also gave two groupings for the four wholesale grades of eggs.

Processed Fruits, Vegetables—A program under which adjustments will be granted on maximum prices of processed fruits and vegetables of the 1943 pack to compensate for wage increases approved by WLB, or required under the Fair Labor Standards Act, where these adjustments are not already specifically provided for, was announced on November 12. Processors whose incurred increases are not already provided for must file a petition with the OPA for increases, according to new interpretations of MPR 306, 409 and 493.

Apples—Maximum prices which processors of products containing apples may pay for this fruit were announced on November 15 in amendment 3 to MPR 425. These prices show a top of $3.10 a hundredweight for Class A. U. S. No. 1 Cannery Grade, 2½-in. size, and for C Grades as established under Washington and Oregon state grades.

Seed Potatoes—Maximum prices for seed potatoes—both domestic and imported "certified" and "war-approved" seed classifications—were established in MPR 492, issued on November 13. Prices for seed potatoes are reduced by an average of 10 to 20 percent from the levels at which they were "frozen" early last season.

They keep their ears in a seamless barrel

Housings for sound detection devices used in protected waters, are made by the famous Hackney seamless construction method. These seamless housings are but one of many types of Pressed Steel Tank Company products now serving in the war effort.

Today, these Hackney seamless housings are part of the equipment used in detecting the presence of lurking submarines and other enemy marauders. In peacetime, the Pressed Steel Tank Company applies its seamless construction process in the manufacture of Hackney Seamless Barrels. Their principal uses are the protection, transportation and storage of chemicals, food, paint and other high value products.

Pressed Steel Tank construction not only meets the wartime requirement of ruggedness, but also assures a sturdy, durable container which will stand up under the toughest kind of peacetime handling and transportation, trip after trip.

The Hackney Seamless Barrel can be cleaned easily and quickly. The curvature of the chime is smooth. There are no crevices, seams or welded joints in the interior of the barrel.

The bilged shape of this Hackney barrel facilitates handling and gives added strength. And a Toggle-tite, or single bolt closure, holds the head air-tight to the top edge, preventing leakage or the entrance of foreign matter.

The Pressed Steel Tank Company is now fully engaged in the manufacture of products for war-important uses. Hackney Barrels and Drums are being used by hundreds of war plants to solve their transportation and storage problems. Hackney containers are, therefore, helping to hasten the day when they will again be benefiting all industry.

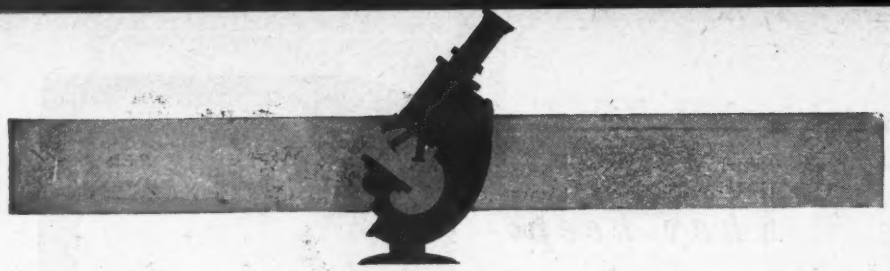
Pressed Steel Tank Company

MANUFACTURERS OF HACKNEY PRODUCTS

General Offices and Factory · 1457 SOUTH 66th ST.

Milwaukee 14, Wisconsin

CONTAINERS FOR GASES, LIQUIDS AND SOLIDS



AVAILABLE TO FOOD EXECUTIVES

A new brochure, "Science at Your Service", has been prepared for executives, plant managers, technologists and others in the food field.

War times present many new problems. New ingredients, new formulas, new processes, new packaging—vitamin retention, enrichment and control.

This brochure describes the facilities of our organization in helping you meet these problems. A copy will be sent upon request.

FOOD RESEARCH LABORATORIES, INC.
48-14 Thirty-Third St., Long Island City, N.Y.
Over 20 years' service to industry

Do you have a pump maintenance problem? Is your pumping installation operating with highest efficiency? Viking's nation-wide sales and service organization would like to help you. Write or call the Viking representative nearest your plant:

CHICAGO
Viking Pump Company
549 West Washington Blvd.
Phone State 6819

CLEVELAND
Viking Pump Company
310 Marshall Building
Phone Cherry 0687

INDIANAPOLIS
Viking Pump Company
320 Pennway Building
Phone Lincoln 4789

KANSAS CITY
Viking Pump Company
601 Pickwick Building
Phone Harrison 8033

LOS ANGELES
Viking Pump Company
2040 South Santa Fe Avenue
Phone Kimball 4470

MILWAUKEE
Viking Pump Company
610 West Michigan St.
Phone Daly 0807

NEW YORK
Viking Pump Company
1841 Broadway at 60th Street
Phone Circle 7-3324

BALTIMORE
Wallace Stebbins Company
Charles and Lombard Streets

BOISE
The Olson Manufacturing Co.
P. O. Box 1487

BOSTON
Haynes Pump and Machinery Company
125 Purchase Street

BUFFALO
Root, Neal & Company
64 Peabody Street

CINCINNATI
William T. Johnston Co.
210 Vine Street

DETROIT
Kerr Machinery Company
Kerr Building

DENVER
Eaton Metal Products Co.
4800 York Street
— Also —
Albuquerque Pueblo
Billings Omaha

DENVER
Hendrie-Balthoff Company
1635 Seventeenth Street

HOUSTON
Southern Engine and Pump Co.
900 St. Charles Street
— Also —
Dallas and Kilgore

LOUISVILLE
Neill La Vielle Supply Co.
505 West Main Street

MEMPHIS
J. E. Dilworth Company
547 South Front Street

NASHVILLE
General Equipment Company
Fred R. Watson
612 Broadway

NEW ORLEANS
Monge Pump & Machinery Co.
Masonic Temple Building

PITTSBURGH
Power Equipment Company
Oliver Building

PHILADELPHIA
Walter H. Eagan Company
2336-38 Fairmount Ave.

RICHMOND
Richmond Engineering Co.
Seventh and Hospital Sts.

SAN FRANCISCO
De Laval Pacific Company
61 Beale Street
— Also —
Seattle and Portland

ST. LOUIS
Lane Machinery Company
Seventh and Market Streets

TULSA
Warner Lewis Company
716 South Troost Street

VIKING PUMPS — FIRST IN AMERICA

VIKING Pump COMPANY
CEDAR FALLS, IOWA

WPB Orders

Glass Containers—An amendment to L-103-b, issued November 1, redefines glass container quotas, increasing the number of glass jars used in November and December of this year. The expiration date of L-103-b was extended to Dec. 31, 1943, by which time a permanent order will be issued. Adjustments in methods of computing quotas were made to adapt them to the new 6-month quota period instead of the old 4-month period.

Wooden Containers—According to WPB's amendment to L-232 issued late in October, wooden containers may not be used for the shipment of a large number of food products and may be used only to a limited extent for a number of other products, including some fruits and vegetables. In general, the items which are prohibited from being packed in wood can be shipped satisfactorily in other types of containers. Products in this classification are cabbage, green corn, dry onions, white potatoes, rutabagas and root turnips.

Paper Shipping Sacks—WPB's Limitation Order L-279 on paper shipping sacks was amended and clarified October 28 to make it more practicable and workable, in view of the paper shortage. Food packers are affected by the extension of the restrictions covering use of paper shipping sacks for shipping over 50 lb. of cereal products and flour. The use of 70-lb. paper has been added to those types permitted in manufacturing multiwall sacks, but quality specifications were eliminated.

Tin—Conservation Order M-81, controlling cans for the packing of certain foods and other products, was amended recently, affecting some 1943 packing quotas and 1943-1944 seasonal packs of citrus fruits. The pack of grapefruit juice for the 1943-1944 season is unlimited, and packs for other citrus fruits are limited to the quantities to be set aside for governmental agencies under FDO 22. The order as amended permits the use of No. 2 cans for packing spinach and other green leafy vegetables.

Canning Machinery—Quotas establishing the quantities of over 150 specified types of canning machinery and equipment were announced recently by WPB. Action was taken through issuance of Schedule III of L-292. The order provides for schedules prescribing the number of units of various kinds of food processing machinery which may be manufactured by any producer. Prior to issuance of the amendment production of canning machinery was limited to 50 percent of the annual average number of units produced during 1939-1941.

Cork—WPB order M-8-a was recently amended with respect to beverage crowns. No person may sell or deliver cork disks not in crown shells to any person other than one regularly engaged in the business of manufacturing and selling crowns with cork disks, if he knows or has reason to believe that the purchase or receipt would be in violation of the terms of the order.

$5,600 FOR AN IDEA

Fred J. Coad developed a machine to improve the method by which St. Louis Independent Packing Co. prepares luncheon meat for the armed forces and Lend-Lease distribution. For this the company awarded him $5,600, the largest award ever made under the company's plan for encouraging suggestions which improve efficiency. The picture shows E. F. Becker, left, superintendent, presenting war bonds to David Kemp, who accepted Coad's award in his absence.

Fiber Shipping Containers—An interpretation to L-317 on the manufacture and use of fiber shipping containers has been issued to clarify certain points. The restrictions are applicable only to new fiber shipping containers. Those containers which have been rejected during the course of manufacture because of errors in size or printing are still classified as new containers.

Paper Cups, Containers—Direction 2 to Priorities Regulation 3 provides exceptions to the regulation which prohibits the use of MRO raitngs to obtain paper cups and food containers. No person may accept delivery of cups or containers which will increase his inventory of any size and type to more than his anticipated requirements for the ensuing 30 days.

"Norelac" Developed

USING vegetable oil that is rich in linoleic acid, USDA has developed a new film-forming resin with properties which promise to make it valuable for containers for food products, chemicals, precision machine parts, and heat-sealed moistureproof packages in general. "Norelac," the name of the new resin, was developed from soybean and linseed oils, but scientists of the Northern Regional Research Laboratory, Peoria, Ill., where the discovery was made, predict that the thermoplastic can be made from a number of vegetable oils. Tests indicate that the product may be used for laminating and moistureproofing cellophane, aluminum and lead foil, glassine, and kraft and sulphite papers.

"Norelac" is said to have excellent adhesive qualities.

Safeguarding the Nation's food supply for the fighting and home fronts emphasizes the importance of proper plant sanitation procedures . . . of providing your products with every protection against bacterial and mold contamination and spoilage.

To meet this situation effectively, many plants employ the Oakite Tested Two-Step Method that helps assure QUALITY CONTROL. FIRST, they utilize specialized, dependable Oakite detergents for THOROUGHLY, QUICKLY removing fats, juices, vegetable particles, syrup and other accumulations from sorting belts, cookers, vats and other processing equipment. SECOND, they treat surfaces with that POWERFUL, fast-working germicidal material . . .

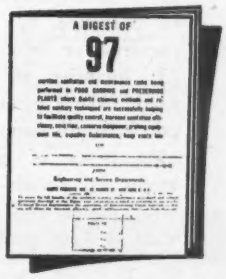
OAKITE BACTERICIDE

(PROTECTED BY U. S. PATENT)

Due to its MORE ACTIVE form of available chlorine, Oakite Bactericide swiftly destroys bacteria and mold . . . helps make product quality MORE CERTAIN. It is completely soluble, instantly ready for use. Drains freely too . . . leaves no white residues on equipment.

New, Data-Filled Digest FREE!

Here is a NEW, unusually informative, 24-page Oakite Digest that gives time-proved methods and formulae for handling 97 essential food plant sanitation and maintenance tasks. Send for your FREE copy of this helpful wartime guide TODAY!



OAKITE PRODUCTS, INC., 26G Thames St., NEW YORK 6, N. Y.

Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE MATERIALS METHODS SERVICE — Buy Bonds for Victory — **CLEANING** FOR EVERY CLEANING REQUIREMENT

• IN STOCK

Glassine

for food packaging

Having trouble finding Glassine available . . . even for permissible uses? Then get in touch with us. As "America's only Glassine Specialist", we are in a position to fill most orders right out of our warehouse.

Let us send samples

of *all* available Types of paper packaging suitable for your use

If your customary packaging material is restricted, simply send us (1) a description of the product to be packaged, (2) size of package required, or units per package and (3) quantity of packages to be used. We'll promptly send you a portfolio of samples of *all* available types of packagings which might be suitable . . . together with prices and other data relevant to your problem.

Packaging Division
E. W. TWITCHELL Inc.
777 Public Ledger Bldg., Phila. 6, Pa.
Specialist in Special-Purpose Paper Packagings

CAPITAL VIEWS

OLEO TAXES—A serious effort is being made in Washington to repeal the tax on colored margarine which has long handicapped margarine sales. It was pointed out in "Capital Views" many months ago that some day the members of Congress were going to find more interested housewives favoring tax repeal than dairy men favoring tax retention. It looks as though that time had about arrived. The fight in Congress is going to be a bitter one. It is not safe at the moment to forecast the probable final vote.

RECLAMATION—War food production has tremendously stimulated land reclamation by irrigation. Interior Department forecasts indicate that about 200,000 more acres will be used in 1944 than were used this year for irrigated-land cropping. Even larger increases in 1945 and 1946 are forecast. Thus, wartime demand for food has given a speed-up that no amount of political pressure had previously made possible. It is going to be necessary for food processors to consider these irrigated acres. They may become a source of valuable raw material for processing. Or they may become a source of competitive fresh fruit, vegetables and other crops to compete with processed foods. Thorough study and a longview consideration of these developments is needed for safe plant planning.

BILLS FOR FOOD—The great increase in the use of vitamins is occasioning some reaction in Washington and in the medical profession. Medical leaders are careful not to attack the pill makers carelessly. But they have begun to warn pill takers that there is only a limited proper place for enrichment of foods, especially to offset recognized demonstrable deficiencies. But food manufacturers probably need a warning like the pill takers so that they may guard against excesses which will flare back as they are recognized by the public. And certainly quality food manufacturers will agree with the distinguished medical editor, Dr. Morris Fishbein, in the hope that the use of pills for food is still far in the future. Were that not so, there would be little comfort for the maker of quality food who furnishes savor and palatability along with nourishment.

ENOUGH FLOUR?—The curtailment of wheat reserves has caused a few folks to worry as to whether there would be enough wheat for the flour milling industry. That needless worry has been eliminated by official statements of the Department of Agriculture. It is pointed out that long before wheat is so scarce that we do without wanted flour, we shall cut back sharply on the use of wheat for animal feed and industrial use like alcohol manufacture. This good news for all millers is supplemented by other encouragement for the Eastern flour millers. The latter group is assured that late boat movement on the Great Lakes will be adequate to rebuild greatly depleted stocks in Eastern states before the freeze-up occurs on the Lakes. Amazing transport records have been made for ore and coal. Recently grain has been moving adequately to insure against serious shortages.

NEW CUSTOMERS—Perhaps we shall have a new class of processed food buyers if the present trend of in-plant feeding develops as now seems likely. With the rationing of food it has become necessary to give manual workers a little extra ration supply. This need has been met in a few establishments very successfully by providing a mid-shift meal at the plant. If such meal is eaten by the worker, he does not need to have extra ration tickets at home. Thus the hard worker who needs the extra meat and extra food of other sorts gets it personally. If this movement develops, as some government agencies believe it should, there will grow up a new class of institutional buyers.

LET THEM STARVE!—It now looks as though official Washington had decided to face a few facts as to needed limits on foreign relief. Some important executives who influence policy are privately confessing that Uncle Sam cannot possibly feed all of Europe even temporarily. There has not yet been official recognition of the harsh slogan, "Let them starve!"; but the planners accept the unquestioned fact that only a limited amount of food relief can be offered for the tens of millions whom we hope can be released from occupied territory during the next twelve months. This means that food production in the United States will continue to be for the United States about as now.

We are probably already up to the maximum export manufacture which can be safely planned. It is important to remember that no administration would dare to go before hungry voters next November if too much food had been sent abroad.

CONSTANT CHANGE—Never was it proved in business more than today that "The most constant thing is change." Daily there are new orders about container restrictions, price ceilings, point values, government purchases, allocations for Lend-Lease, set-aside for government and a multitude of other factors. Planning for these rapid shifts is not altogether possible. The only safe plant plan is one which provides a maximum quick flexibility in type of product, size and type of package, and even schedules of production. Conditions of 1944 promise to impose more such burdens on the food technologist than even hectic 1943 has done.

NO CONTROVERSY—Neither the railroad wage dispute nor the coal mine contract trouble is a controversy between labor and management. In both cases these two important groups of workers and owners are caught in the meshes of a net of political manipulation in Washington. The outcome of the coal mine case is certain to be increased wage demand that will gradually spread even into the food processing industries. We might as well get ready for it, as the effort of Washington to control the cost of living proves ineffective.

Packaging Men Tackle Problems

Manuals of packaging engineering and glass packing discussed at Institute meeting

Two long-range projects were discussed at the annual meeting of the Packaging Institute in New York on November 4 and 5. H. A. Barnby reported that the manual of recommended practice for glass packaging, which has been under preparation by a committee of the institute for three years, has now been revised to incorporate recent improvements in automatic handling and filling of glass containers. The manual soon will be ready for distribution.

A committee under the chairmanship of Charles A. Southwick, Jr., outlined a proposed manual on packaging engineering. This is, for the present, definitely confined to flexible containers (excluding collapsible tubes). Test methods developed in the pulp and paper industry are available for the packaging materials and shipping containers, but the committee asked for the help of package users in suggesting and developing tests measuring those properties of the product which must be known in order to design a suitable package. Food manufacturers who have developed tests which show the reaction of the product on the packaging material, either mechanical or chemical, can be particularly helpful.

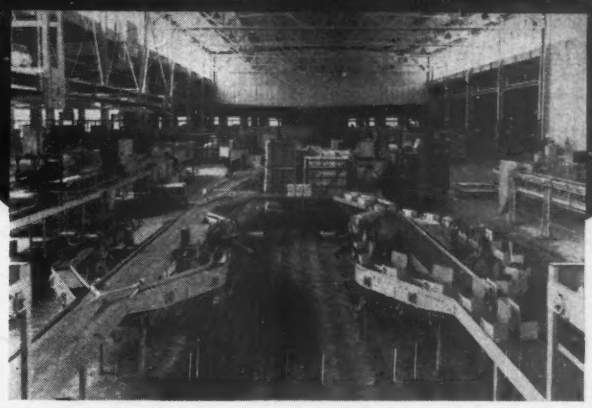
The round table discussion on "Materials in a War Economy," with Walton D. Lynch presiding, brought out very clearly the fact that at present and for some months to come, pulp and paper are the critical materials. The shipping container reuse program is extremely important. However, manufacturers have already pared down specifications on shipping containers to a minimum and such containers are not designed for reuse. Every container must be carefully inspected before being used again. The program can be successful only where one person, trained for the job, is made responsible for inspection and approval of all containers before they are used again.

Nutrition Grants Announced

DURING the two years it has been in operation, the Nutrition Foundation, Inc., has made total grants of $396,040, according to a recent announcement by George A. Sloan, president of the Foundation.

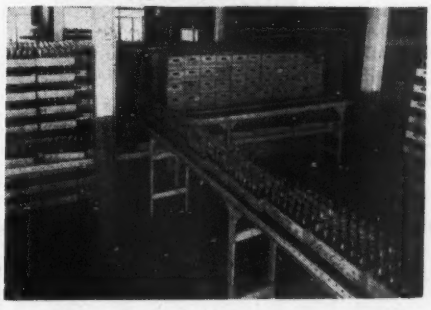
The grants for research in nutrition, providing for diversified studies in the field, have been made to 41 universities, medical centers and other research institutions throughout the United States and Canada.

Your Share OF THE 125 MILLION TONS



Strietman Biscuit Company's new streamline plant is completely equipped with Lamson conveyors.

Atlantic & Pacific Tea Co. Warehouse, showing unique method of hauling trucks by Lamson Overhead Conveyors for faster storage, and speedier assembly of orders.



Empty as well as filled cases move by gravity about this modern Coca-Cola Plant — equipped with Lamson Gravity Conveyors.

★ This year, and for many years to come, America must produce 250 billion pounds of food — a stupendous job of processing, packaging, storing, shipping.

★ To help you handle your share more efficiently, more economically, Lamson offers a complete line of gravity, overhead, live roll, slat, and booster conveyors. Lamson conveyors multiply the productivity of your labor force, increase the usefulness of available floor space, eliminate unproductive handling, and provide better control of goods on hand.

Write for pamphlets showing Lamson conveyors at work. Or, if you have a specific problem, let our engineers help. Wire or write

LAMSON CORPORATION

Dept. FI *Syracuse, N. Y.*

Makers of CONVEYORS and PNEUMATIC DISPATCH TUBES

ARMY TWILL by REEVES
SANFORIZED*
MADE TO GOVERNMENT SPECIFICATIONS

REEVES Glengarrie POPLIN

Demand these labels when buying uniforms

UNIFORMS OF REEVES ARMY TWILL CAN TAKE IT!

Uniforms that are neat in appearance and easy to keep clean are essential in the food industry. So specify *Reeves* famous fabrics for *your* uniforms.

REEVES ARMY TWILL meets exacting U. S. Government Tests for better wear, longer life, and colorfastness. Its fabric vitality keeps it "in shape" under trying conditions.

For matching shirts, specify GLENGARRIE POPLIN, a durable, stylish fabric in a wide range of colors. Both fabrics are Sanforized* against shrinking.

**Fabric shrinkage not more than 1% (U. S. Government Test CCC-T-191-a)*

See your nearest dealer for uniforms, sport and work clothes made from these famous fabrics, or write for colorful leaflet to:

OVER 60 million yards of Reeves Army Twill sold to the U. S. Army

REEVES BROTHERS, INC.
54 WORTH STREET NEW YORK CITY

Ask Any STEINLITE User NOW!

The STEINLITE One Minute Moisture Tester

Perhaps you've been thinking about a Steinlite Moisture Tester as a production control instrument in the dehydration of foods. Now—during the peak season of use—is the time to find out what a Steinlite will do for you. If you do not know of a Steinlite user in your vicinity, write us and a list will be sent promptly. Incidentally, there are more Steinlites in use than all other electric moisture testers combined.

Steinlite is FAST . . . . with it, a moisture test is made in one minute by an experienced operator; in 2 or 3 minutes by almost any operator.

Steinlite is ACCURATE . . . . checks against government oven method. Made by a pioneer organization of radio engineers.

Steinlite is EASY TO USE . . . . almost as easy as tuning in a radio. Operated on the electrical impedance principle. Sold on 10 day Free Trial. Prompt shipments on orders placed now.

"HEADQUARTERS" for scales, triers, sieves, all grain and seed testing equipment.

SEEDBURO EQUIPMENT COMPANY

Formerly SEED TRADE REPORTING BUREAU
FOUNDED 1912

634 BROOKS BLDG. CHICAGO 6, ILLINOIS

International Food Agency Is Proposed

GOVERNMENT officials are reported to be considering formation of an international food agency to assure greatest possible agricultural production throughout the world. Department of Agriculture officials are pushing the project as the only systematic way to achieve our objectives of a world food program. The international organization is needed to "measure available world food supplies in relation to requirements, to accumulate the information needed to do this, and to recommend such general corrective measures as may be found necessary in food production, distribution and consumption," according to a statement issued by the Office of Foreign Agricultural Relations.

Holding that European import requirements will be large after the war, Mordecai Ezekiel, economic adviser to Secretary of Agriculture Wickard, outlined the problems of the United Nations in occupied lands as follows: (1) To bring in the food immediately needed to prevent starvation. (2) To restore transportation and food distribution and to see that the food available is distributed as fairly as possible. (3) To see that local production of food is increased.

New Projects Tackled By Enzyme Laboratory

THE USDA Enzyme Laboratory, headed by Dr. A. K. Balls, which was moved from Washington to the Western Regional Research Laboratories in Albany, Calif., in June of this year, is engaged in research projects of unusual interest. Most of the personnel and the entire equipment were transferred to the new location. Originally established in 1931 under Dr. F. C. Blanck (now of H. J. Heinz Co.), who resigned in 1940, the work of the laboratory included enzyme actions not directly connected with foods. At present the staff is working largely in the field of cereal chemistry.

The laboratory is best known for its work on proteinases. Two such enzymes from papaya latex have been crystallized. The influence of proteolytic enzymes on the quality of bread doughs, and the extraction of other enzymes such as amylase by means of proteolysis, are contributions of interest. As an example, the proteinase present in wheat flour can be activated by reducing agents such as sulphite. After activation, this proteinase digests the insoluble amylase protein of the flour to the point where the latter is soluble. A considerable amount of amylase can thus be removed from flour and utilized for the conversion of starch to sugars in other systems.

BUILDS GOOD WILL

National Coffee Association recently paid tribute to Paul C. Daniels, center, United States delegate and chairman of the Inter-American Coffee Board, for his outstanding work in promoting and cementing good neighbor relations betwen the coffee industry of the United States and the coffee-producing countries of Latin America. Mr. Daniels was guest of honor at a dinner tendered him by the Association. He is a member of the State Department.

Accredited to the laboratory is the preparation of the first crystalline protein to be made from wheat. The substance is apparently a protamine and interesting for its toxicity toward certain saprophytic bacteria and for its very high sulphur content.

WFA Undertakes Food Compression Program

To REDUCE from 20 to 80 percent the bulk of a number of important dehydrated foods now being shipped overseas, the War Food Administration recently instituted a compression program that makes previous dehydration programs look like practice operations. Contracts have been let by the Food Distribution Administration for millions of pounds of compressed cheese-flavored and pea-flavored soya soups, which save about 40 percent in cargo space. Research programs to compress other dehydrated foods are in full swing, including experimentation with pears, peaches, apricots, apples, eggs, milk, beets, cabbage and rutabagas, wheat flour, corn meal, linseed meal, rye flour, wheat bran, wheat middlings and dehydrated meats.

The stepped-up program is attributed not only to the saving in cargo space, but to the value of compressed foods in battle areas where there may be few unloading facilities, few warehouses, damaged ports, and roads and rails torn up by the retreating enemy.

Standard Conveyors Synchronize Production All "Along the Line"

WORK in process is quickly shunted from one machine line to the next in this effective Standard Conveyor installation. The transfer table in the foreground consisting of a section of roller conveyor mounted on wheels, provides quick easy means of shifting the work-pieces from one line of roller conveyor to another. Two machine lines are thus continuously fed with work — without halt or interruption and with a minimum of manual handling.

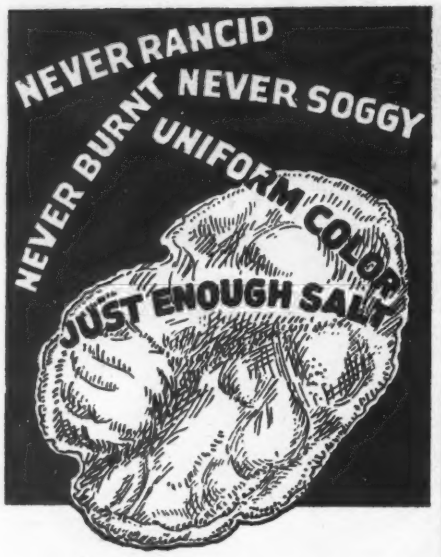
Knowing how to apply power and gravity conveyors to best advantage is equally as important as building them well. An experience record of more than 35 years, serving all classes of industry and business, qualifies Standard Conveyor to be of service to you.

Write for valuable reference book—"Conveyors by Standard" — Catalog No. FI-12.

STANDARD CONVEYOR COMPANY
General Offices:
NORTH ST. PAUL, MINNESOTA
Sales and Service in All Principal Cities

STANDARD
Gravity and Power
CONVEYORS

★ ENGINEERED FOR FASTER PRODUCTION ★



In Other Words . . .

The Perfect Chip!

Can you realize the profit in producing — continuously — perfect potato chips?

WITH

FERRY CONTINUOUS POTATO-CHIP MACHINES

you are assured of a perfect product. Machine is adjustable, and quickly changed, for turning out light, dark or medium chips — all crisp, clean and salted to a delicious flavor.

Every step in the process is automatic, and there is push-button control of cleaning, peeling, slicing, frying, drying, cooling and salting.

Read how these FERRY machines will make money for you, as well as help solve the man-power shortage. Available in 5 sizes, from 50-lbs. to 350-lbs. capacity per hour.

Write today for the full facts, Ask for Bulletin "F.I"

Also makers of

SLICERS AND AUTOMATIC SLICERS, FEEDERS AND CAN WASHING MACHINERY

J. D. FERRY CO.

129 SO. CAMERON ST.

HARRISBURG, PA.

Food Administration Orders

Frozen and Dried Eggs—Consumers will be able to get more egg products as a result of action taken on October 22 by WFA in removing restrictions on liquid, frozen and dried whole eggs. The action was taken through revocation of FDO 41, which since March 25 has required all spray-process dried whole egg production to be reserved for government purchase, and restricted production of liquid and frozen eggs and certain types of dried eggs to the quantities produced and sold for commercial use in the United States from Feb. 1, 1942, through Jan. 31, 1943.

Peanuts, Peanut Butter—WFA recently suspended the provisions of FDO 78, relating to the allocation and use of peanuts and peanut butter. The action, following the temporary suspension of the order announced on October 1 deferring quota provisions of the order until November 1, was taken to help industrial users of peanuts utilize to the maximum the 700,000 tons allocated for edible purposes.

Apples—WFA has released apples packed in closed containers prior to October 4 from the restrictions of FDO 83, regardless of their size, quality or variety. The order provides that low-quality or small apples, grown in or shipped for commercial purposes into specified areas, may be sold only to authorized processors. Apples packed in closed containers were ready for market when the original order was placed in effect. Regardless of size, all apples which meet the minimum requirements, as specified in the order, for U. S. No. 1 grade, or the state fancy grade in California, Oregon or Washington, are released from the provision requiring them to be sold only to processors.

Turkeys—With enough turkey on its way overseas for the holiday dinners of the armed forces, WFA has released turkey for sales to civilians, by canceling FDO 71. The turkey embargo had been in effect since August 2 to make it possible for the U. S. armed forces to purchase 12,000,000 lb. of turkeys in time for shipment overseas and to obtain part of the requirements for the forces here at home.

Coconut, Babassu and Palm Kernel Oils—WFA has terminated FDO 46 which required importers of coconut, babassu and palm kernel oils to set aside 25 percent of their imports for war purposes. The order is no longer necessary because all imports are controlled by the government. The release of October 27 includes text of the revocation.

Citrus Products—Set-aside percentages for citrus products were announced in FDO 22.5, issued early in November, to permit canners to make plans as they begin their 1943-1944 season. Citrus canners were directed to set-aside for government war needs approximately the same quality of canned grapefruit juice from the 1943-44 pack as they did last season. Canners were requested to save 7,400,000 cases for war requirements. The entire production of other canned citrus products will be reserved for government needs.

Cheddar Cheese—During December, the month of seasonally lowest cheese output, manufacturers of Cheddar cheese will be required to set aside only 25 percent of their monthly production for government purchases, according to WFA announcement on October 30. The action is contained in FDO 15.4. Allocations of Cheddar cheese to the armed forces, our Allies and emergency war programs during the period October through December total slightly more than 95,000,000 lb., or about 50,000,000 lb. more than the set-aside program is expected to yield during the three months.

Fish Oils—WFA on November 1 prescribed new quotas and quota periods for the use of fish oils, and has made several changes in the fish oils limitation order FDO 60, to permit a better direction of this raw material to essential uses. The amended order, which now includes Alaska seal and rosefish oils, permits the unlimited use of fish oils in alkyd resins, metallic soaps and rubber compounding and permits the unlimited use of Alaska herring and Alaska seal oils in the manufacture of natural leather. Packers of canned salmon were allowed 100 percent of the quantity used in 1942. Manufacturers of vitamin feeding oils were allowed 100 percent of the quantity used in the corresponding quarter of 1942.

Peanut Butter Payments—WFA announced that payments at the rate of 4½ cents per pound will be made to manufacturers of peanut butter on peanut butter shipped on and after Nov. 1, 1943, to primary distributors, wholesalers or retailers or from manufacturers to their branch warehouses or retail stores for sale in containers of 2 lb. or less to consumers.

Beef Set Aside—Federally inspected slaughterers have been directed by WFA to increase by 5 percent the quantities of beef set aside for the armed forces. Amendment 4 to FDO 72.2, effective November 8, required federally inspected slaughterers to increase from 45 to 50 percent the quantities of beef meeting Army specifications that must be set aside. This 50 percent of certain grades of beef from federally inspected plants represents only 25 to 28 percent of the total estimated beef production.

Honey-sugar Sirups—WFA has included honey-sugar sirups within the scope of a food order relating to the conservation and distribution of honey. Manufacturers of food products using sirups containing honey were required, beginning October 28, to apply the volume of honey in such sirups against their honey quotas as authorized in FDO 47.1.

Sugar—Raw sugar allotments for the period between Jan. 3, 1942, and Sept. 30, 1944, were established on November 3 in amendment 2 to FDO 7-1, for all the major sugar companies of the states. All such raw sugar which a refiner has purchased, imported or

accepted delivery of between Jan. 1, 1942, and the effective date of the order was charged against such allotment.

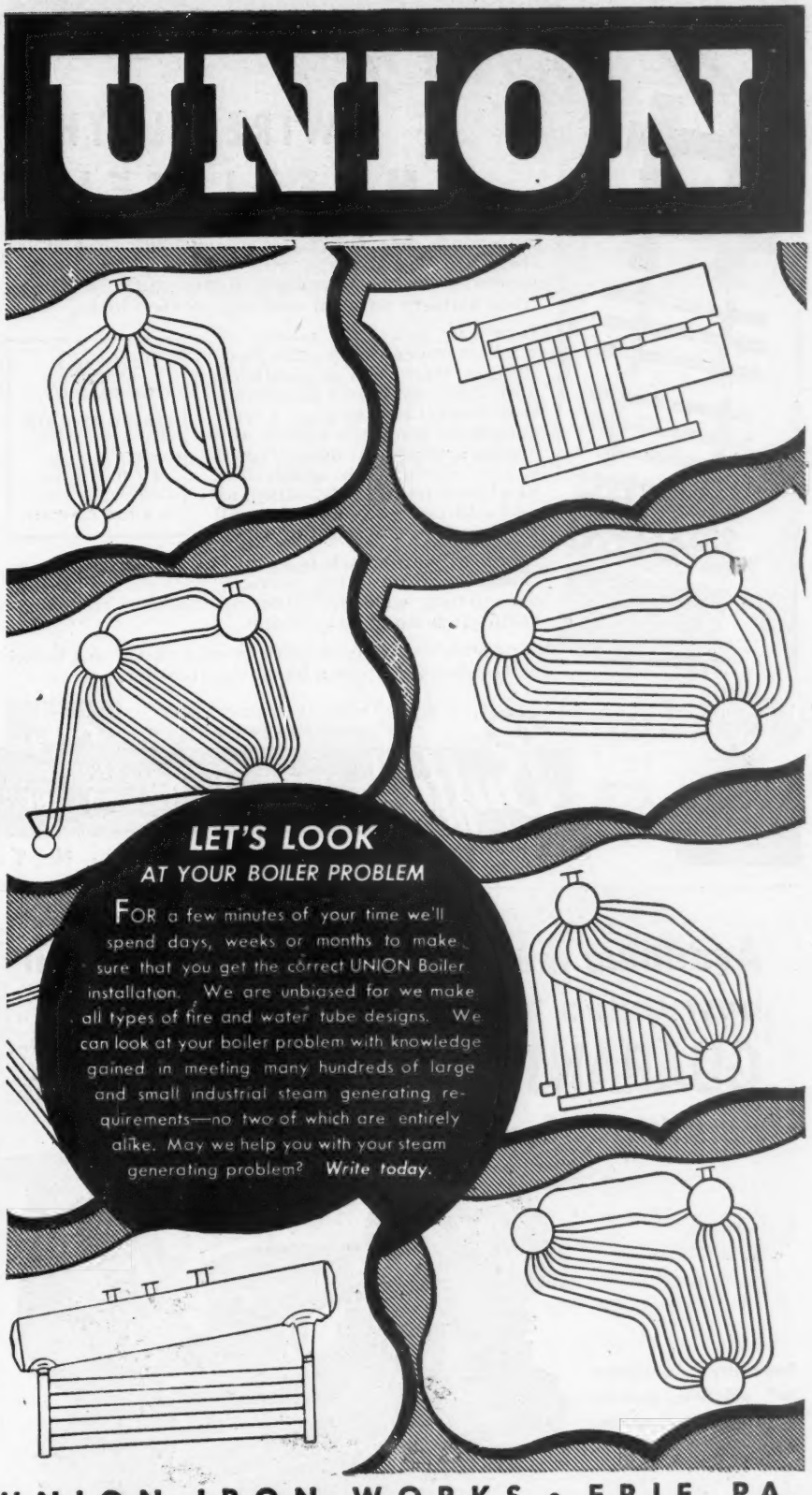
Dairy Foods and Mix—WFA on November 5 issued FDO 8-2 increasing the percentage of frozen dairy foods and mix allowed processors in California. Each processor who sells and delivers frozen dairy foods in California and another state or states may apply an increase of 20 percent to that portion of his quota which was based upon the production of frozen dairy foods for sale in California during the base period.

Canned Food—WFA on November 2 announced that it had directed the release of approximately 2,790,000 cases of canned peaches, peas and tomato catsup to civilian consumers. These foods are a portion of the reserves owned and held by canners to meet possible emergency requirements of the government. Under FDO 22.4, FDA announced that these reserves would not be purchased unless they were necessary to meet war needs, and if not, canners would be permitted to sell them in normal channels of distribution.

Peas, Beans—Removal of governmental set-aside requirements for dry peas and split peas and a reduction in the required reservation of dry edible beans were announced on November 2 by WFA. These steps were taken on November 1 to assure availability of supplies of dry peas and beans allocated for civilian use in the 1943-1944 season. FDO 45 eliminates any further reservation of peas under the order and releases those set aside for government purchase which are not under contract.

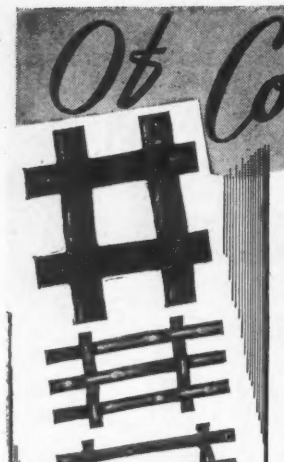
DOUGHNUTS SELL BONDS

During the Third War Loan Drive in New York City, doughnuts were given away with the purchase of U. S. War Stamps and Bonds. And this little promotion maneuver—tried out in cooperation with the U. S. Treasury Department—clicked to the tune of $103,433.65 in sales. A box of doughnuts was given to each purchaser of $2 or more worth of stamps, and more than a million and a half doughnuts were given away, these being made hot on the spot by means of a "Donutmobile," which was contributed by Doughnut Corp. of America along with the operating crew and the prepared mix.


UNION
LET'S LOOK
AT YOUR BOILER PROBLEM
FOR a few minutes of your time we'll spend days, weeks or months to make sure that you get the correct UNION Boiler installation. We are unbiased for we make all types of fire and water tube designs. We can look at your boiler problem with knowledge gained in meeting many hundreds of large and small industrial steam generating requirements—no two of which are entirely alike. May we help you with your steam generating problem? Write today.
UNION IRON WORKS • ERIE, PA.
BOILERS
PRESSURE VESSELS • PLATE FABRICATION

Of Course you can get

WIRE CLOTH IMMEDIATELY!



Countless rolls and pieces of "Buffalo" industrial wire cloth are regularly stocked for immediate shipment. Frequently, you can fill your requirements from these stocked items and save weeks from delivery dates of specially woven cloths.

How can you keep posted on what's currently stocked? Buffalo Wire Works publishes and mails monthly an attractive Stock List showing a wide variety of lengths, widths and grades available at once. This is a free service—no obligation. Send your name, title, company and address today and you will be placed on the mailing list.

AVAILABLE AT ONCE ON PRIORITY
BRASS WIRE CLOTH
45 x 45 mesh—.0075"
206 ft. x 24 in.
177 ft. x 25 in.
28 ft. x 25 in.
In Rolls or Cut Pieces

Material from stock is cut to any desired length. Complete production services include trimming, die cutting, welding, soldering, binding and fabricating into finished products.

Whatever you may require in wire cloth, not listed in the Stock List, can be woven to order.

FREE STOCK LIST Mailed Monthly On Request

DOING BUSINESS FROM COAST TO COAST FOR 74 YEARS

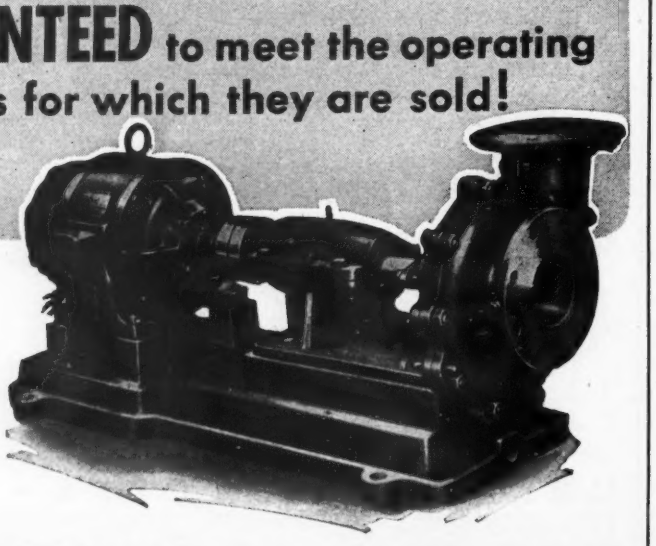
Buffalo WIRE WORKS CO., INC.

ESTABLISHED 1869 AS SCHEELER'S SONS

452 TERRACE BUFFALO 2, N. Y.

Available **in the type, size and material best suited to your needs . . . . . .**

GUARANTEED to meet the operating conditions for which they are sold!



Specially designed for efficient service in the food industries.

FREDERICK PUMPS

The FREDERICK IRON & STEEL CO.
Frederick, Maryland

Refrigeration Research Officers Appointed

ORGANIZATION of the Refrigeration Research Foundation, a nonprofit group, continued in November with the appointment of officers, an executive committee, and a board of governors to serve until the first annual meeting in 1944. The Foundation also issued a statement of by-laws giving the following objects as set forth in the Articles of Incorporation: (1) To improve the methods of refrigeration for the better preservation of food and other commodities essential to the health and welfare of the American people. (2) To develop and support research in refrigeration of food and other commodities through a program of grants to research institutions. (3) To establish fellowships to aid in training competent personnel. (4) To establish a repository of scientific information relating to refrigeration. (5) To cooperate with and aid government agencies, institutions of research and others in connection with their work on refrigeration.

Present officers of the Foundation are Samuel C. Prescott, chairman; Roy M. Hagen, president; Arnold T. Hampson, vice-president; G. D. Allman, secretary-treasurer.

Hendrickson on Committee

ROY F. HENDRICKSON, director of Food Distribution, heads the newly-formed Food Requirements and Allocations Committee, organized by Marvin Jones, War Food Administrator, to recommend allocations for final decision by the Administrator in consultation with the Combined Food Board. The membership committee, established in an amendment to Executive Order 9334, represents all U. S. agencies that are claimants for food either for domestic or foreign account.

Dairy Industry Pools Truck Deliveries

OFFICIALS of ODT have put their heads together and come out with 12 industry transportation plans covering portions of seven states to save truck miles in the dairy-industry. The plans, which should save 2,210,310 truck miles annually, were submitted and approved under a program agreed to by the ODT, WPB and the Department of Justice, whereby milk producers, distributors and processors cooperate to reduce the mileage of truck operations and thereby conserve gasoline, tires, parts and manpower. Under this procedure, participants in industry transportation plans are safeguarded from prosecution under antitrust laws when engaging in group

action to conserve transportation. States affected by the pooling operations are Alabama, Georgia, Minnesota, North Carolina, Ohio, Tennessee and Wisconsin.

Key Men in OPA Food Branch Are Named

GENERAL Manager Chester Bowles of OPA late in October announced three principal appointments in the Distribution Branch of the Food Price Division of that government agency. New chief of the Distribution Branch is Max A. Christopher, wholesale grocery executive who is president of Symns-Shafer Mercantile Co., Colby, Kan. New head of the Distribution Price Section under Mr. Christopher is Raymond M. Meserve, Portland, Me., formerly with Armour & Co., and new acting head of the Distribution Analysis Section is Jacques Phelps of Chicago, owner of Thompson Management Service, which has specialized in wholesale grocery efficiency work.

Ore Boats Released To Haul Grain

WITH the Office of Defense Transportation's authorized release of ore boats to haul 15,000,000 bu. of grain during the first half of November, the 50,000,000 bu. still to be shipped east by way of the Great Lakes before the navigation season ends has started to move. Whether or not grain officials will be able to increase the number of lake shipments above the 135,000,000 bu. season quota already established by WPB to cut the amount which must move east by rail will depend upon the length of the season.

Preliminary figures on the total domestic and Canadian grain movement down the lakes in October amount to approximately 22,000,000 to 24,000,000 bu., including 17,500,000 bu. shipped from Duluth in American ships.

Activity in grain buying was heavy during November, with Commodity Credit Corp. purchasing 818,000 bu. of wheat in Canada.

SCHEDULE OF EVENTS

DECEMBER

8- 4—Society for the Advancement of Management, national conference on management problems of conversion, Waldorf-Astoria Hotel, New York, N. Y.

6-11—Nineteenth Exposition of Chemical Industries, Madison Square Garden, New York, N. Y.

7- 9—American Society of Refrigerating Engineers, 39th annual meeting, Benjamin Franklin Hotel, Philadelphia, Pa.

JANUARY

10-14—National Canners Association, processors conference and annual meeting, Chicago, Ill.

Here's how to make your present Valves LAST LONGER..SERVE BETTER

● Experience shows that even the best valves last longer and serve better if given periodic inspection . . . and repairs when necessary.

Today when new valves and even repair parts are scarce and require high priorities, it is more essential than ever to take good care of your present valves.

The Lunkenheimer "N-M-D" Valve illustrated is typical of the simple, rugged, easy-to-maintain construction that distinguishes Lunkenheimer design practice.

Thus maintenance men working with these valves find them easier to keep fit and on the job..find that Lunkenheimer valves will last longer and serve better with less attention and time out for repairs.

Use the complete facilities of Lunkenheimer distributors.

Simplicity of Design Means Easier Maintenance

Disc can be renewed in a jiffy. Simply unscrew locknut from disc holder, remove old disc and insert new one—reassemble and the valve is ready for use. Or better still, keep on hand some spare disc holders complete with discs — slip a disc holder and a new disc on the stem and remove the old disc from the holder later.

LUNKENHEIMER VALVES

Take the $$$$$$$$ out of $tone$

● Now, with critical war shortage of labor, streamline STONING in your mill. Removing stones has always been slow, laborious and costly out of proportion to other steps in processing cereals, soy beans, and other dry foods. To eliminate this great headache of the cereal and other dry food processors, we have developed a new type stoner—revolutionary in design, amazing in efficiency, low in first cost, in operation. Removes stones, glass, non-magnetic metals, and all other hard, dangerous contaminations from cereals, soybeans, and other beans, and other food products, with, 1) an action so sensitive the tiniest particles are easily removed; and 2) operating cost so low it is relatively insignificant; and 3) 99.9% efficiency. Capacity up to 16 tons per hour. Write for Bulletin FI-1243.

SS&S AIR-FLOAT STONER

SUTTON, STEELE & STEELE, Inc.
DALLAS, TEXAS

In Canada — Kipp Kelly, Ltd., 68 Higgins Ave., Winnipeg
Foreign — Separations Engineering, Ltd., 133 Bush House, Aldwych, London

Cutback In Dry Eggs Gives More Shell Eggs

SHARP cuts in requirements for powdered eggs have caused a serious dislocation in the egg drying industry. Estimated requirements as of January, 1943, were for 483,000,000 lb. for the year. Capacity at that time was about 300,000,000 lb. per year. If there had been no change in either productive capacity or in requirements, the industry could not have come close to supplying the demand. Actually, requirements were scaled down and facilities increased. Capacity of the industry now is about 420,000,000 lb. a year, which is still less than the estimated requirements last January.

Following the installation of new capacity and the rationalization of the requirements, cutbacks of major proportions occurred abruptly. It is now estimated that government agencies, including Army and Navy, will actually take only about 260,000,000 lb. this year. Simple arithmetic shows the industry has approximately 160,000,000 lb. of unneeded capacity at the moment. To ease the situation, restrictions of FDO 41 have been revoked to permit the sale of dried eggs in the domestic market. Requirements of FDO 40 also have been eased. This was the order under which shell eggs were held for future drying.

It appears that now would be a good time for egg dryers to introduce their product to new customers in the home market.

With reduction in demand for eggs for drying, and easing of the set-a-side order, it is also apparent that more shell eggs are likely to be available for consumption in the United States. This should offer some relief in the tight protein food situation resulting from scarcity of meats and fish.

Final Crop Goals Show Some Changes

FIGURES announced last month and discussed on page 121 of FOOD INDUSTRIES for November, 1943, have been somewhat changed by an announcement of final 1944 crop goals made by War Food Administrator Marvin Jones on November 11. Most important differences in the final figures from the tentative figures were caused by the short supply of animal feedstuffs.

In the final figures corn is now set at 100,253,000 acres, compared to the tentative goal of 100,000,000 acres and 1943 plantings of 96,818,000 acres. Oats have been raised from 39,000,000 acres to 39,558,000 acres, sorghums from 16,400,000 to 16,740,000 acres and tame hay from 62,023,000 to 62,838,000 acres. To compensate, goals for wheat, rye and rice have been slightly reduced, although wheat is still at 67,030,000 acres compared to 54,159,000 acres in 1943.

Soybean acreage, still planned at more than 2,000,000 acres above 1943, is now set at 13,654,000 acres, a slight reduction, while goals for peanuts have been raised from 5,500,000 acres to 6,158,000 acres, which compares to 5,013,000 acres in 1943.

The only other notable change from figures published last month is in sugar beets, now set at 951,000 acres compared to 900,000 acres in the tentative goal. The figure for this crop in 1943 was 636,000 acres.

CONSTRUCTION NEWS

	Pending (thousands)	Awarded November (thousands)	Total Awarded 1943 (thousands)
Bakery	$80	.....	$40
Beverages	790	.....	.....
Canning and Preserving	130	.....	295
Cold Storage	405	$190	615
Confectionery	.....	.....	230
Grain Mill Products	200	40	2,027
Ice Manufactured	.....	.....	80
Meats and Meat-Products	90	.....	525
Milk Products	510	89	1,131
Miscellaneous	170	.....	3,526
	$2,375	$319	$8,469

Pickle Supply Off

PROSPECTIVE production of cucumbers for pickles in 1943 is now estimated by the U. S. Department of Agriculture at 6,102,000 bu. While this figure exceeds the 1932–1941 average production by 17 percent, it falls 27 percent under last year's record output of 8,307,000 bu. The estimates exclude green cucumbers processed as "overnight dills" and similar pickles, but include all other types.

In spite of reduced production of pickles this year as compared to last, consumption is high and is reducing stocks. Total salt and dill stocks on hand Oct. 1, 1943, were estimated at 6,752,000 bu., compared to 8,651,000 bu. on Oct. 1, 1942, and to a 1932–1941 average for Oct. 1 of 6,996,000 bushels.

Oils and Fats Supply Reported Sufficient

ESTIMATES released by the War Food Administration in mid-November for 1933–1944 supplies of fats and oils indicate ample supplies for the year. Domestic production is expected to account for 90 percent of requirements, and the remainder will be imported.

Figures indicate that the amount

needed for all military, Lend-Lease, and civilian needs, for the year beginning Oct. 1, 1943, will be 11,700,000,000 lb., which is 1,500,000,000 lb. more than a normal peacetime supply. Production in the United States will account for 11,300,000,000 lb., while imports of 1,100,000,000 lb. are expected. The excess over requirements will be used to rebuild depleted domestic stocks back to normal.

Of the prospective supply, slightly more than 69 percent will be allocated to food uses, and 70 percent of this allocation will be available for civilian food requirements. This will make a per capita allowance for the crop year of around 44 lb., compared to 47 lb. in the calendar year 1943. This civilian allowance is expected to be made up of around 1,600,000,000 lb. of butter, 1,700,000,000 lb. of lard, 1,900,000,000 lb. of shortenings and oils, and 400,000,000 lb. of oleomargarine (on fat content basis).

To make available these various requirements of fats and oils, domestic production for the crop year 1943–1944 is expected to be as follows:

Product	Quantity in Billions of Pounds
Butter	2.1
Lard	3.1
Soybean oil	1.4
Cottonseed oil	1.3
Corn oil	0.2
Linseed oil	0.9
Peanut oil	0.2
Inedible oils and greases	1.6
Miscellaneous	0.5
Total	11.3

INDICATORS

Flour production in October, 1943, by mills accounting for 73 percent of United States output, was reported by *The Northwestern Miller* at 15,156,456 sacks, compared to 14,283,725 sacks in September.

Salmon pack in Alaska this year, according to final figures recently announced by the government, totaled 5,404,710 cases, compared to 5,015,374 cases in 1942.

Fish, frozen, in storage on Oct. 1, 1943, totaled 97,122,085 lb., compared to 115,127,914 lb. a year earlier.

Fish, salted and smoked, in storage on Oct. 1, 1943, totaled 22,167,712 lb. compared to 25,367,336 lb. on Oct. 1, 1942.

Cocoa bean arrivals in the United States up to the end of the first week of November, totaled 3,544,047 bags, compared to 1,073,984 bags in a like period of 1942.

Pea canners in 1943 packed a total of 35,051,559 standard cases, according to National Canners Association. This compares to 35,255,945 cases in 1942.

Sardine pack in California, up to Nov. 6, 1943, totaled 1,499,220 cases, according to the California Sardine Products Institute.

Grapefruit juice in the amount of 2,400,000 cases has been released from government stocks for resale to original vendors.

Citrus fruit production in the 1943–1944 crop year is forecast at about 13 percent over output in the preceding year.

Herring production in Alaska in 1943 totaled 84,323,250 lb., compared to 36,602,250 lb. in 1942.

Eggs, dried, produced in September, 1943, totaled 19,871,000 lb., compared to 21,690,000 lb. produced in September, 1942.

Butter, creamery, produced in September, 1943, totaled 126,485,000 lb., a drop of 7.9 percent from September, 1942, production, and 9.1 percent below the 1933–1942 September average.

Butter, creamery, production during the first nine months of 1943 totaled 1,387,565,000 lb., 1.5 percent below production in the corresponding months of 1942, but 0.8 percent over the 1933–1942 average for the period.

Cheese, American, produced in September, 1943, was 65,950,000 lb., 2.9 percent below the September, 1942, production, but 44.5 percent above the 1933–1942 September average.

Cheese, American, produced during the first nine months of 1943 totaled 633,900,000 lb., 18.8 percent below output in the like 1942 period, but 55.4 percent above the 1933–1942 average for the period.

Milk, evaporated, produced in September, 1943, was 232,763,000 lb., compared to 221,679,000 lb. in September, 1942. This output was 24 percent over the 1937–1941 September average. Output for the first nine months of this year was 2,562,053,000 lb., 14 percent below the output of the corresponding 1942 period.

Milk, condensed, all kinds, produced in September, 1943, totaled 64,773,000 lb., compared to 69,021,000 lb. produced in September, 1942.

Milk, dried whole, produced in September, 1943, totaled 9,450,000 lb., compared to 6,363,000 lb. produced in September, 1942. For the first nine months of 1943, production was 98,175,000 lb., an increase of 119 percent over the output of the corresponding 1942 period.

Milk, dried skim, produced in September, 1943, totaled 34,650,000 lb., compared to 47,568,000 lb. in September, 1942. For the first nine months of 1943 production was 410,621,000 lb., down 21 percent from the corresponding 1942 period.

Oleomargarine sales in September, 1943, as indicated by sales of internal revenue stamps, totaled 47,327,667 lb., 47 percent over sales in September, 1942. For the first nine months of 1943, sales were 354,441,096 lb., 45 percent above sales in the corresponding 1942 period.

Wine production in California in 1942 was 53,900,000 gal., compared to 105,198,000 gal. in 1941, according to Wine Institute.

Fruits, frozen, in storage on Nov. 1, 1943, totaled 241,267,000 lb., compared to 221,727,000 lb. on Nov. 1, 1942, and to a 1938–1942 average of 174,322,000 lb. for the date.

Vegetables, frozen, in storage on Nov. 1, 1943, totaled 190,283,000 lb., compared to 115,810,000 lb. a year earlier and to a 1938–1942 average of 89,801,000 lb. for the date.

Butter, creamery, in storage on Nov. 1, 1943, amounted to 210,722,000 lb., compared to 86,981,000 lb. on Nov. 1, 1942, and to a 1938–1942 average of 140,419,000 lb. for the date.

Cheese, all kinds, in storage on Nov. 1, 1943, was 222,857,000 lb. The figure a year before was 195,378,000 lb. and the November 1 average in 1938–1942 was 155,267,000 pounds.

Eggs, case equivalent, in storage on Nov. 1, 1943, totaled 10,298,000 cases. On Nov. 1, 1942, the number was 7,926,000 cases and the November 1 average in 1938–1942 was 7,014,000 cases.

Poultry, frozen, all kinds, in storage on Nov. 1, 1943, totaled 139,740,000 lb., compared to 161,011,000 lb. on Nov. 1, 1942, and to an average of 112,034,000 lb. in 1938–1942 for the date.

Meat, all kinds, in cure and frozen storage on Nov. 1, 1943, totaled 600,030,000 lb., compared to 463,788,000 lb. a year before and to 414,535,000 lb. as a 1938–1942 November 1 average.

Lard in storage on Nov. 1, 1943, was 126,395,000 lb. and rendered pork fat on the same date was 30,205,000 lb. These figures a year earlier were 52,371,000 lb. and 5,176,000 lb. The combined average figure for the two products in 1938–1942 was 118,909,000 pounds.

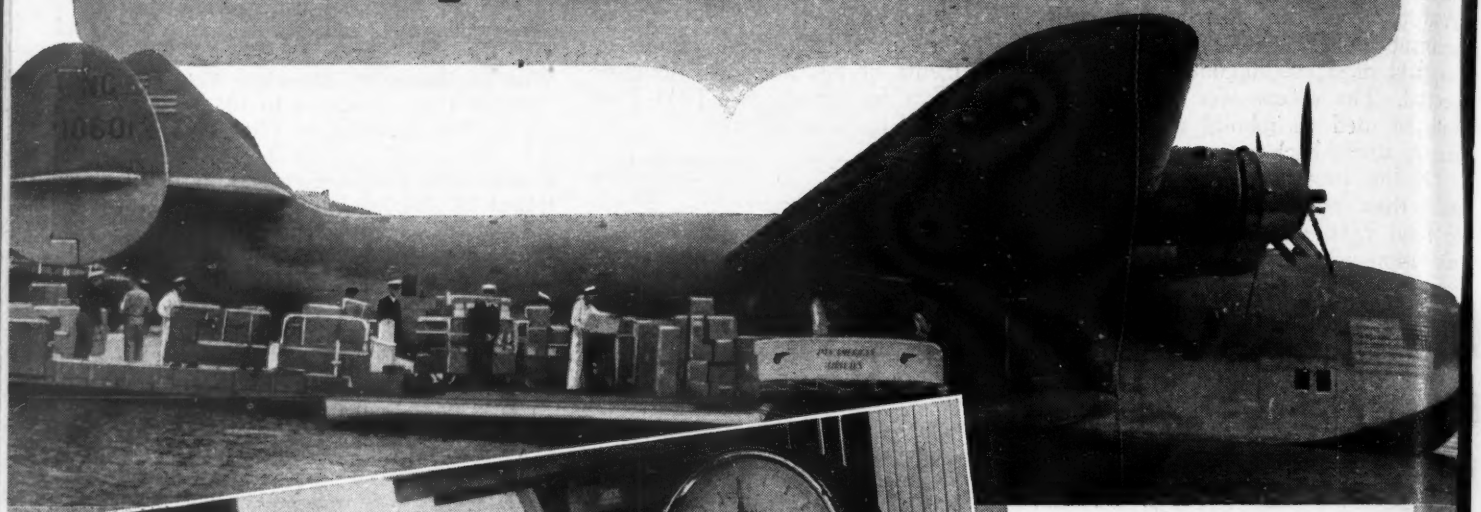
Business activity index of *Business Week* for Nov. 13, 1943, was 235.9, compared to 238.8 one month earlier and to 217.7, for the corresponding 1942 date. (Note: This index has been refigured to a new base.)

Weekly wholesale food price index of Irving Fisher stood at 121.2 on November 12, compared to 116.4 on the corresponding 1942 date.

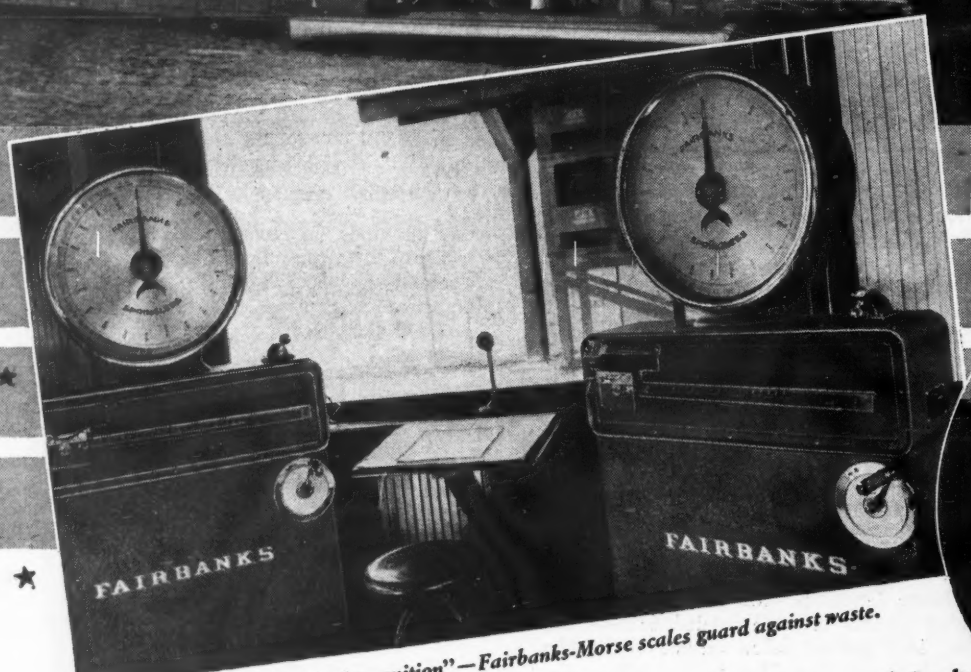
Cost of living index of National Industrial Conference Board for October, 1943, was 103.7, up 0.6 percent from September, 1943, and compared to an index of 99.8 in October, 1942.

In Wartime Production . . .

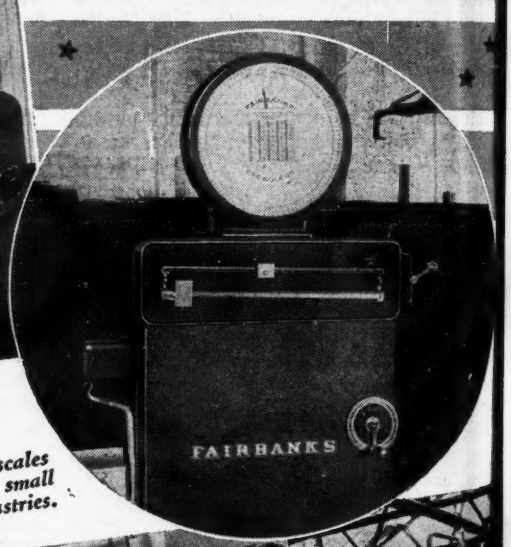
It's *Every Ounce* That Counts!



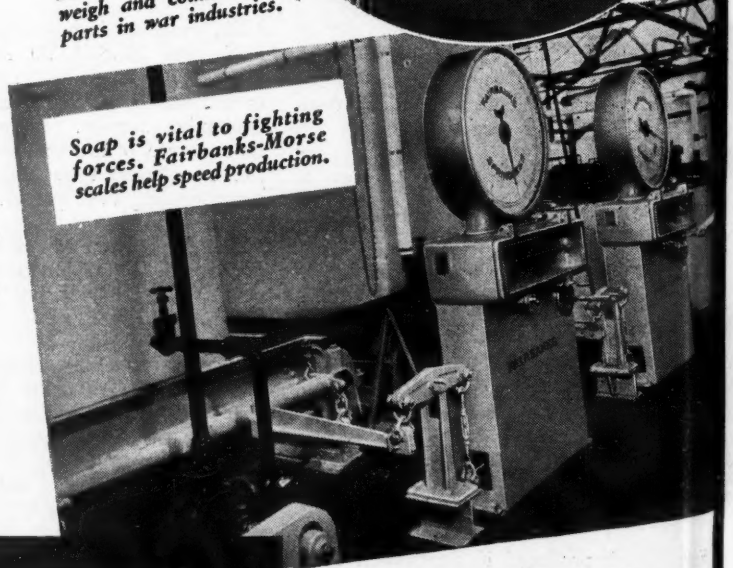
Fairbanks-Morse scales weigh cargo and crew before clipper ships take off for unannounced destinations.



"Coal is Ammunition"—Fairbanks-Morse scales guard against waste.



Fairbanks-Morse scales weigh and count small parts in war industries.



Soap is vital to fighting forces. Fairbanks-Morse scales help speed production.

• **OUNCES** make pounds and pounds make tons . . . *millions of tons* of wartime production that pass over Fairbanks-Morse scales to help speed the allies to victory.

Food . . . steel . . . munitions . . . chemicals . . . guns . . . tanks . . . textiles . . . *anything and everything* that goes to war must be weighed. It must be weighed accurately . . . quickly—at speeds which human hands can't match, and with accuracy that human eyes can't equal. That's why industry, from the smallest to the largest, finds Fairbanks-Morse scales indispensable in keeping production lines rolling.

If you have weighing problems *now* or if you are *planning ahead* . . . let the Fairbanks-Morse Scale Engineering staff help *you* as it is helping so many others. Write, wire, or phone Fairbanks, Morse & Co., Fairbanks-Morse Building, Chicago 5, Illinois.

FAIRBANKS-MORSE

DIESEL ENGINES
PUMPS
MOTORS
GENERATORS
WATER SYSTEMS
SCALES
STOKERS
FARM EQUIPMENT
RAILROAD EQUIPMENT

FAIRBANKS SCALES

Scales

MEN • JOBS • COMPANIES

INDUSTRY

Borden Co., New York, has recently purchased Tyler Milk Products Co. in Tyler, Tex., and Texas Milk Products Co., with headquarters at Marshall, Tex. The two additional units will become part of the southern division of Borden under the direction of A. J. Smith, chairman.

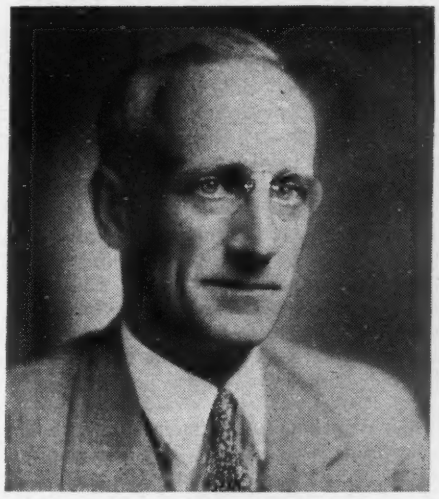
Broder Canning Co.'s dehydrating plant at Lethbridge, Alberta, Canada, will not start processing operations until next spring due to difficulties in obtaining delivery of some equipment.

Comstock Canning Corp.'s six plants have been presented the War Food Administration "A" flag. Comstock is the first food processing company to win the new "A," the highest award to be given to seasonal processing plants.

Fort Worth Poultry & Egg Co., Inc., Fort Worth, Tex., and Stahl-Meyer, Inc., Louis Meyer Plant, Brooklyn, N. Y., have been awarded the Army-Navy "E" pennant for excellence in production.

Grand Rapids Packing Co. plans to build a $60,000 addition to its plant in Grand Rapids, Mich., to provide more space for coolers and to carry on processing and freezing operations.

Kittitas County Dairymen's Association, with headquarters in Elleburg, Wash., plans to build an addition to their plant to manufacture powdered milk. Construction of the building will enable the association to enter the fluid milk field for the first time.



CLARENCE FRANCIS

AUSTIN S. IGLEHEART

General Foods Corp., New York, has appointed Clarence Francis, formerly president of the company, to the position of chairman and chief executive, succeeding C. M. Chester, who has been elected to the new post of chairman of the executive committee. Austin S. Igleheart, executive vice-president, becomes president of General Foods, succeeding Mr. Francis. In step with the growth of the organization and its program of postwar development, Thomas G. Spates, Arthur C. Schier, Thomas M. Rector, Charles G. Mortimer, Jr., and Curtis H. Gager, have been elected vice-presidents.

Laughead Packing Co. is packing quick frozen whole peeled tomatoes at its Fresno, Calif., plant.

S. A. Moffett Co., Seattle, Wash., frozen food packers, plans to operate again this season a subsidiary frozen food plant in the Rio Grande Valley.

National Cheese Institute, Inc., Chicago, is distributing a booklet entitled, "War on Insects," to help dairymen improve the production and handling of milk.

National Biscuit Co.'s New York plant has been presented an additional white star for its Army-Navy "E" pennant.

National Starch Products, Inc.'s Indianapolis corn milling plant is contributing to the war effort by supplying leading pharmaceutical houses with one of the nutrient mediums used for growing the mold from which the new drug penicillin is obtained.

Pepsi-Cola Co., New York, is planning negotiations to purchase the Espano sugar mill near Perico, Matanzas Province, Cuba. The mill has a capacity of 600,000 bags.

South Georgia Pecan Shelling Co. has bought the pecan shelling plant of A. Pearlman & Co. in Valdosta, Ga.

Summerland Evaporating Co., Ltd., Summerland, B. C., Canada, has begun operations handling approximately six tons of apples a day.

Valley Frozen Foods Co. has completed its plans to construct a quick frozen foods plant at Roswell, N. M.

Van Brode Milling Co., Clinton, Mass., has purchased American Cereal Food Co., makers of "Weetabix," a product well known in England but not marketed extensively in the United States.

Wewoka Frozen Foods, Inc., has been newly formed in Wewoka, Okla., by J. W. Pipkin, of Seminole, D. B. Welprop, of Tulsa, and P. Simpkins, of Ada, Okla.

JAMES R. BISHOP

PAUL D. V. MANNING

International Minerals & Chemical Corp., Chicago, Ill., has appointed James R. Bishop, formerly vice-president of American Maize-Products Co., and recently chief consultant to the grain products branch of the Food Distribution Administration of WFA, to the position of vice-president in charge of the amino products division. Paul D. V. Manning, director of research for the organization, has also been elected a vice-president. He is in charge of International's long-range development program and is responsible for the technical work for the operating division of the corporation.

Now available
on small monthly payments

SEE IT 10 DAYS FREE

PERRY'S
CHEMICAL ENGINEERS' HANDBOOK

Prepared by a Staff of Specialists

Editor-in-Chief, John H. Perry
E. I. du Pont de Nemours & Co.

2nd edition, 3029 pages, 1300 illustrations, 1000 tables, $10.00

Now you can start using Perry's Handbook at once—paying in small monthly installments while you use it. No strings to the offer—no mark-up to cover installment charges—no difference in quality of the book. Just a special offer to urge action. Whether you are a practicing engineer, executive, plant or laboratory worker, or mechanical engineer—no matter what your questions—whether directly concerned with unit operations, or afield in such subjects as Plant Location or Fire Protections—you are sure to find it answered here, concisely explained and illustrated, authoritatively handled by a specialist and instantly accessible.

A complete chemical engineering library in one volume

- **1030 pages of mathematical, physical and chemical fundamentals**
- **1060 pages of data and practice on unit processes**
- **740 pages of important engineering information**
- **129 pages on related business and professional subjects**
- **70-page quick-reference index**

10 DAYS FREE EXAMINATION
SEND THIS COUPON

McGRAW-HILL BOOK CO., INC.
330 W. 42nd Street, New York City

Send me Perry's Chemical Engineers' Handbook for 10 days' examination on approval. In 10 days I will send $1.00, plus few cents postage, and $3.00 monthly for three months thereafter, or return book postpaid. (Postage paid on orders accompanied by remittance of first installment.)

Name .....
Address .....
City and State .....
Position .....
Company .....Food 12-43

PERSONNEL

John J. Antun has resigned his position as vice-president of Merchants Refrigerating Co. to join the firm of Ries-Munoz & Antun, Inc., as consultant to the frosted food trade. Mr. Antun is a well-known figure in the frosted food industry.

Walter T. Fitzpatrick has been elected director of sales of the grocery products division of Borden Co., New York, succeeding Arthur W. Ramsdell, who has resigned.

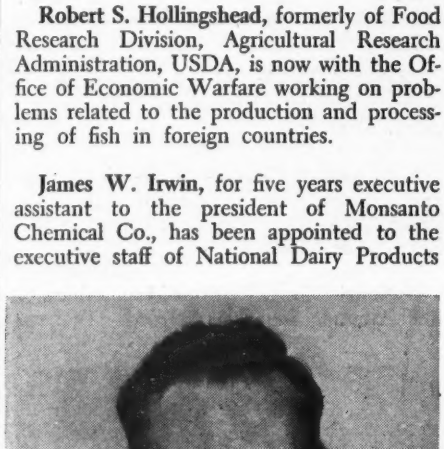
Lucille Hac has joined the research division staff of International Minerals & Chemical Corp., in Chicago, as senior research chemist. Her work will consist of protein research in International's new research laboratory at its plant in Rossford, Ohio.

B. W. Hammer, formerly professor of dairy bacteriology, and N. E. Fabricious, assistant professor, Iowa State College, have joined the research staff of Golden State Co., San Francisco, Calif.

Lloyd Hedrick, former manager of the Buffalo, N. Y., plant of Ralston-Purina Co., has been elected a vice-president of the company.

Robert S. Hollingshead, formerly of Food Research Division, Agricultural Research Administration, USDA, is now with the Office of Economic Warfare working on problems related to the production and processing of fish in foreign countries.

James W. Irwin, for five years executive assistant to the president of Monsanto Chemical Co., has been appointed to the executive staff of National Dairy Products Corp., New York. Mr. Irwin has had extensive management and industrial relations experience.



FREDERIC G. BERNER

Formerly chief of the Coffee Rationing Branch of OPA, Frederic G. Berner has been named assistant to H. W. Roden, president of Harold H. Clapp, Inc., manufacturer of baby foods, succeeding Jack Ross, who has resigned. Mr. Berner has been with OPA since May, 1942, and for six years previously had been doing market research in the food and drug fields for A. C. Nielson Co.

A. S. YOHALEM

Best Foods, Inc., New York, N. Y., has recently appointed A. S. Yohalem to the office of secretary of the company, succeeding J. E. Mount. Mr. Yohalem has been a member of the legal department for the past five years.

F. H. Long, formerly bacteriologist at Iowa Agricultural Experiment Station in Ames, Iowa, is now a member of the research department staff of Sugar Creek Creamery, Danville, Ill.

J. C. Marquardt, formerly assistant professor in dairying at the New York State Agricultural Experiment Station at Geneva, has been named assistant director of the division of milk control of the New York State Department of Agriculture and Markets.

Lee Marshall has resigned as director of Official Materials & Facilities of the War Food Administration to resume his duties as chairman of the board of Continental Baking Co., New York.

J. J. Nichols has been appointed executive director of Vitamins, Inc., manufacturer of vitamins A and D.

Edward A. Pierce has been named manager of Nehi Beverage Co., Portland, Ore., distributors of Royal Crown and other beverages.

Thomas A. Scott, president of Richmond Dairy Co. and Southern Cream & Milk Co., Inc., is the newly elected vice-president of the Southern Association of Ice Cream Manufacturers.

Lillie M. Stuckey has been named director of Borden Co.'s food service department, where she will have charge of the company's experimental kitchen.

Herbert E. Wallace, who has been with Commodity Credit Corp. for the past few years, has been elected manager of the Georgia-Florida-Alabama Peanut Association, growers' cooperative, with headquarters in Camilla, Ga.

DEATHS

George A. Beardsley, 66, president of J. W. Beardsley's Sons, Inc., Newark, N. J., manufacturer of shredded codfish and other fish products, Nov. 6, in East Orange, N. J.

Henry H. Greene, 79, formerly treasurer of Walter M. Lowney Chocolate Co., Boston, Mass., Nov. 8, in Worcester, Mass.

Jennie H. Kittelberger, 76, vice-president of Webster Canning Co., Rochester, N. Y., recently, in Webster, N. Y.

George W. Loft, 78, founder and former head of the Loft chain of candy stores in New York, Nov. 6, in Baldwin, L. I.

Philip R. Jordan, 58, of Ramsey, N. J., superintendent of the Franklin Baker division of General Foods Corp., Nov. 10, in Battle Creek, Mich.

Gustavus F. Swift, 62, vice-president of the board of Swift & Co., Chicago meat packers, recently, in Chicago.

Fletcher P. Veitch, 76, collaborator of the Bureau of Agricultural and Industrial Chemistry of USDA, Washington, D. C., recently, in College Park, Md.

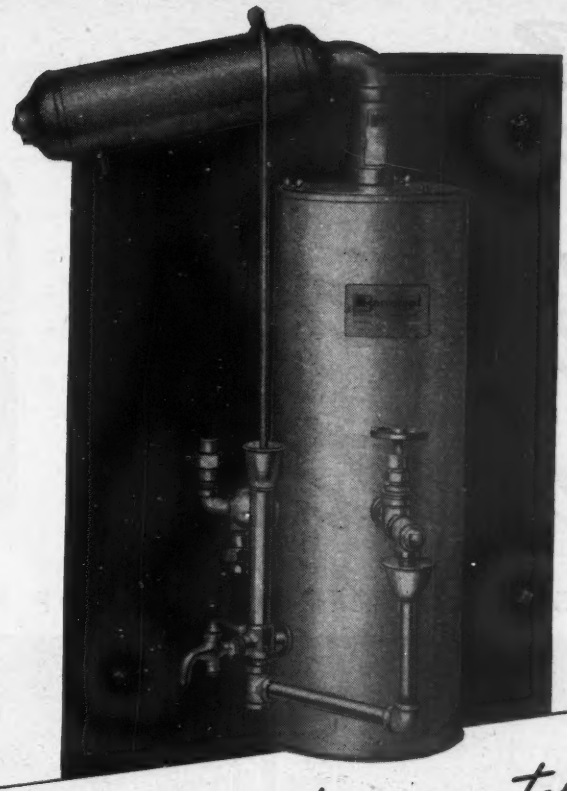
ASSOCIATED INDUSTRIES

Florasynth Laboratories, Inc., New York, manufacturer of chemical products, flavorings and extracts, has recently appointed Alexander Katz, chief chemist and former vice-president, to the presidency of the company, succeeding Louis A. Rosett, who has retired. David Lakritz becomes chief chemist in charge of production in the New York plant.

B. F. Goodrich Co., Oaks Division, Oaks, Pa.; Keasbey & Mattison Co.'s Ambler plants, Ambler, Pa.; Landers, Frary & Clark, New Britain, Conn.; the Caldwell plant in Chicago of Link-Belt Co.; and York Corp., York, Pa., have been presented the Army-Navy "E" award for excellence in production. American Foundry Equipment Co., Mishawaka, Ind., and the Niagara Falls plant of Mathieson Alkali Works, Inc., have been given an additional white star for their pennants, in recognition of their continued contribution to the war effort.

Monsanto Chemical Co., St. Louis, Mo., has elected Francis J. Curtis, formerly director of development, to the position of vice-president. He will be in charge of Monsanto's long-range program of development here and abroad.

Turco Products, Inc., Los Angeles, Calif., makers of industrial chemical compounds, many of which are used in the food industries, has named Nathaniel Baum as head of its newly formed organic research department.



It's the best for every test...

BARNSTEAD

Distilled Water

For control work in food laboratories, Barnstead Water Stills are your best bet. For the distillate of these stills is not only chemically and bacteriologically pure . . . but, of even more importance, it is *consistently* pure. It is always the same high quality.

This eliminates variables that upset control. It gives you one more constant factor for your tests . . . a constant factor that means better results.

Always . . . like many leaders in the food industry . . . insist on Barnstead Water Stills for your control labs. They are available in sizes from ½ gallons per hour all the way up to 500 gallons per hour. Operation by gas, steam, or electricity.

Barnstead
STILL & STERILIZER CO. Inc.

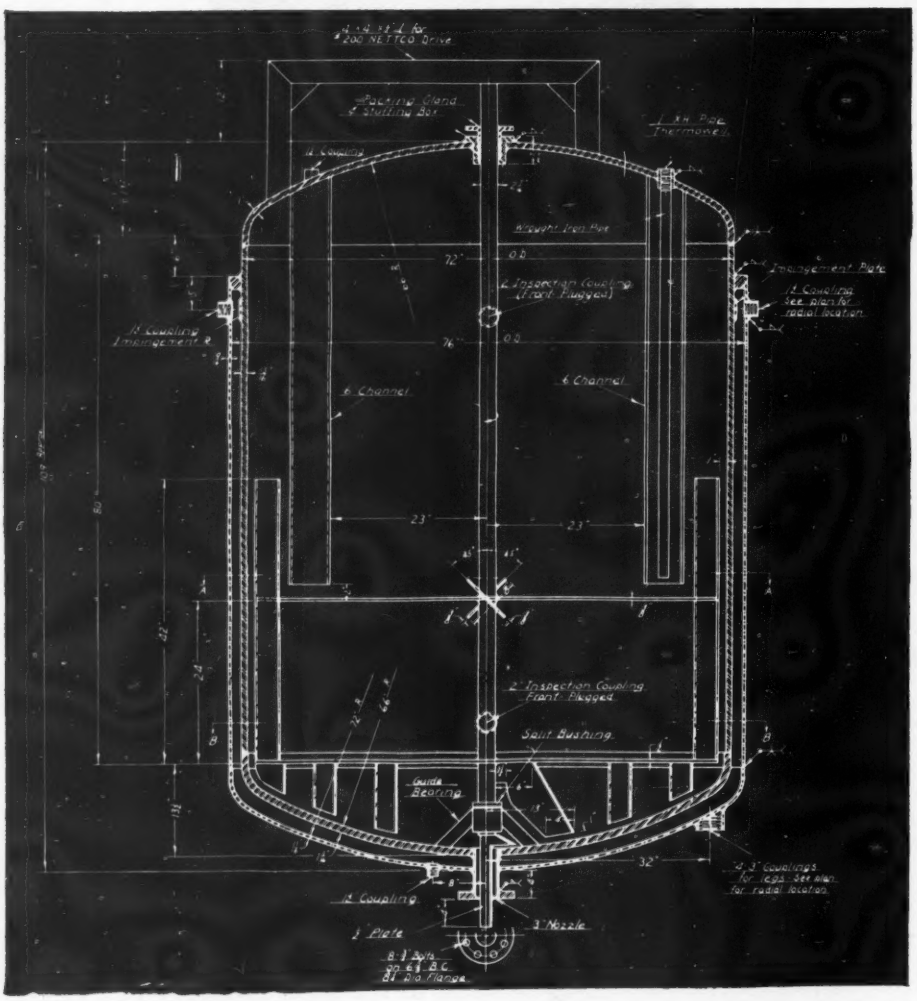
48 LANESVILLE TERRACE • FOREST HILLS • BOSTON, MASSACHUSETTS

Sturdy, Efficient, Adaptable

PATERSON - KELLEY STEAM - JACKETED MIXING KETTLE

A standard type jacketed kettle fitted with a specially designed Patterson-Kelley mixer. 76" O.D. x 109" high over the shell exclusive of supports. Constructed to the A.S.M.E. code for a working pressure of 150 lbs.

—THANKS TO A SPECIAL TYPE OF PATTERSON-KELLEY MIXER



A.S.M.E. APPROVED DRAWING OF KETTLE ILLUSTRATED ABOVE

By varying the type, physical dimensions and rate of speed of the mixing mechanism, this Patterson-Kelley Steam - Jacketed Mixing Kettle can be adapted to any process requiring this kind of equipment.

ADVANCE NOTICE—Bulletin No. 203, a new informative circular on Patterson-Kelley equipment for the food and process industries, is going to press. Write for your copy today.

PATTERSON-KELLEY FOR DEPENDABLE, ECONOMICAL SERVICE

EST. 1886

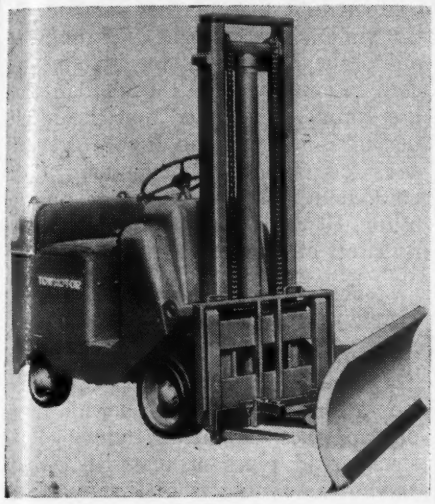
PATTERSON-KELLEY HEAT EXCHANGE ENGINEERS

THE Patterson-Kelley CO., INC.

114 WARREN ST., EAST STROUDSBURG, PA.

MANUFACTURERS FOR THE FOOD AND PROCESS INDUSTRIES

FOOD EQUIPMENT NEWS



Snow plow attachment for lift trucks.

Snow Plow Attachment

A HANDY snow plow attachment for industrial lift trucks, that makes possible quick clearing of plant yard driveways and walks, has been developed by Towmotor Corp., 1226 East 152nd St., Cleveland, Ohio. The plow attachment has a 23 in. high moldboard, is 64 in. long and has a plowing width of 53 in. at extreme angle setting. Other models are available in greater widths or with spring-trips. The plow mounts on the forks of the lift truck by means of two-bolt draw clamps.

Pump Mounting

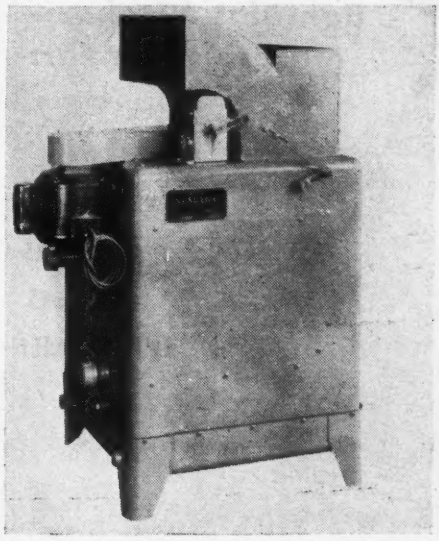
BLACKMER PUMP CO., Grand Rapids 9, Mich., has brought out a wall mounting for rotary pumps. It consists of a base made from steel plate and angles, and so welded as to provide an adequate mounting surface for the pump and power unit that can be attached to any convenient vertical surface. The pump furnished with this mounting is a 25 gal. per minute pump operating at 15 lb. per sq.in. pressure and 450 r.p.m. The motor is a 1½ hp., 1,800 r.p.m. gearhead motor.

Fuel Cutoff Device

COMBUSTION CONTROL CORP., 77 Broadway, Cambridge 42, Mass., has developed Fireye type F28C, a photoelectric system for providing instantaneous fuel cutoff in any pressure fed burner in the event of flame failure. Capable of controlling devices with any flame intensity, the system can be applied to oil, gas or pulverized coal burners and operates entirely from direct observation of the flame by means of photoelectric cells.

Air or Gas Cooler

NIAGARA BLOWER CO., 6 East 45th St., New York 17, has brought out the "Aero" aftercooler for cooling compressed air or gases by the evaporative cooling principle to obtain lower temperatures. A feature of the new design is high capacity in a compact apparatus. Air, drawn by a fan through a water spray across coils containing compressed air, is the cooling medium and temperatures within 10 deg. F. of the wet bulb air temperature can be maintained.



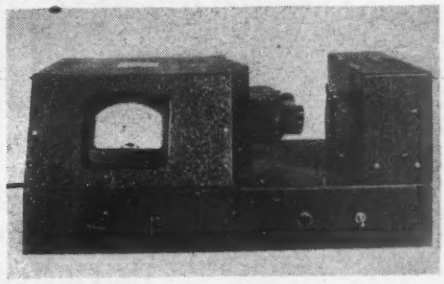
Aftercooler for compressed air or gas.

Payroll Calculator

BERGER-BRICKNER CO., 433 So. Spring St., Los Angeles 13, Calif., has brought out a new model payroll calculator on which overtime as well as straight time payroll calculation can be quickly figured. Forty hours plus overtime can be calculated in one operation on one side of the device for those who require total pay checks amounts only. The reverse side can be used for figuring straight time and overtime as separate items. Calculations can be made for all hourly rates of pay from 40 cents to $1.74 per hour with one-half cent spread between rates and for time periods up to 80 hours with divisions of tenths and quarters of an hour. The computer is made of Mansonite and lacquered wood.

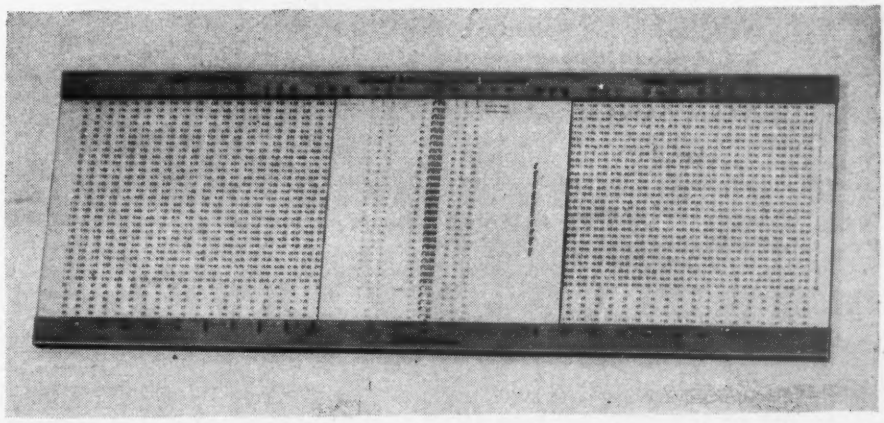
Density Measurement

PHOTOSWITCH, INC., 77 Broadway, Cambridge, Mass., has brought out the Densitometer Series D90, a photoelectric system for the accurate measurement and control of the density of transparent materials such as liquids and gases. Originally developed for use in determining the density of optical filters, the system is used also for density control of films and plastics, for turbidity control of liquids in a wide variety of processes, and for turbidity control of gases where extreme accuracy is desired.



Measuring instrument for determining the transparency of materials.

The instrument, in operation, projects two beams of light from a single light source. One beam passes through any standard filter, the other beam passes through the material which is being tested. These two light beams are



Payroll calculating device.

NEW BOOKLET!

Shows how R&M HOISTS save MANPOWER

Contains Vital Information For:

1. BAKERS
2. CANNERS
3. LOCKER MEN
4. DEHYDRATORS
5. MEAT PACKERS
6. ELEVATOR MEN

Send for Free Copy, Bulletin 830 . . . to Help Streamline Your Production and Thus Increase Output with Less Manpower

R & M Electric Hoists solve Food Processors' problems in lifting and conveying. They cut costs, speed production, release manpower for other vital work.

You can achieve "airline speed" on your production lines with these mechanical wizards. Superbly engineered, they handle loads from all angles with perfect balance . . . on 24-hour schedules, year-in and year-out.

In capacities of 1,000 to 15,000 lbs., there is an R & M Electric Hoist for your operation. Each can be equipped with special trolleys to fit any type monorail.

Write today for Bulletin 830 . . . or consult your nearest R & M Sales Office or one of the R & M Distributors below.

SPECIAL R&M FOOD HOIST DISTRIBUTORS

A. K. Robins & Co.....Baltimore
Berlin Chapman Co.....Berlin, Wis.
Food Machinery Corp.....Harlingen, Texas
F. H. Langsenkamp Co.....Indianapolis
Robert W. Taylor Co.....San Francisco
Sprague-Sells Div., Food Machinery Corp. .....Hoopeston, Ill.
Dunkley Co.....Kalamazoo, Mich.
Chisholm-Ryder Co.....Niagara Falls
James Q. Leavitt Co.....Ogden, Utah

ROBBINS & MYERS • Inc.

HOIST & CRANE DIVISION — SPRINGFIELD, OHIO

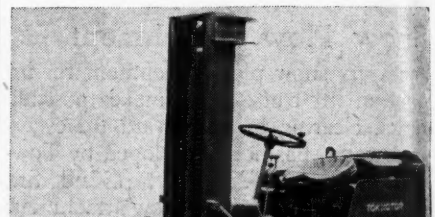
In Canada: Robbins & Myers Co. of Canada, Ltd., Brantford, Ont.

MOTORS • MACHINE DRIVES • FANS • MOYNO PUMPS • FOUNDED 1878

then projected by an optical system to a single phototube. By means of an electronic and mechanical timing system, the instrument constantly measures the ratio of transparency of the sample as compared to that of the standard. As the same source of light and the same phototube and amplifying systems are used to examine both the standard and the sample, it is stated that the resulting measurements are highly accurate and are completely independent of circuit conditions. Variations of plus or minus 10 volts from the standard have no effect on the reading.

Fork Lift Truck

TOWMOTOR CORP., Cleveland 10, Ohio, has brought out Model LT-50, to provide a fork lift truck with a wide range of capacities for lifting, moving and stacking all types of materials, which at the same time is in line with the wartime standardization program of

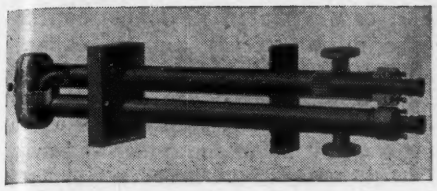


New fork lift truck of standardized design.

WPB. This truck is available in 5,000-lb. capacity with either 104-in. or 144-in. lift or in 4,000 lb. capacity with 144-in. lift, and replaces former models LT-46 and LT-53. The new truck has a travel speed of 8 miles per hour and is powered with a gasoline engine. Its lifting speed is 40 ft. per minute. The wheelbase is 50 in. and the outside turning radius is 92 in. with an overall width of 42 in. and a length less fork of 88 in. Standard fork equipment is 36 in. long.

Sectional Heat Exchanger

BROWN FINTUBE CO., Elyria, Ohio, has brought out a new construction of its "Sectional Hairpin" heat exchanger. A feature of this new construction is a non-removable rear end assembly. The operator needs only to remove the bolt, back the cover plate off far enough to clear the plate of the adjacent section, and then swing the plate through a 180 deg. arc and rebolt it in this position to gain clear and unobstructed entrance into the heat exchanger. This is said to



New design of sectional heat exchanger.

simplify greatly both installation and maintenance. Also, this easy accessibility permits the interchange of Fintubes having various surface ratios in order to suit the operation being carried out. In addition, the new heat exchangers have welded one-piece "hairpins" which are said positively to prevent any mixing of the materials on the tube side and the shell side of the exchanger.

Self-priming Pump

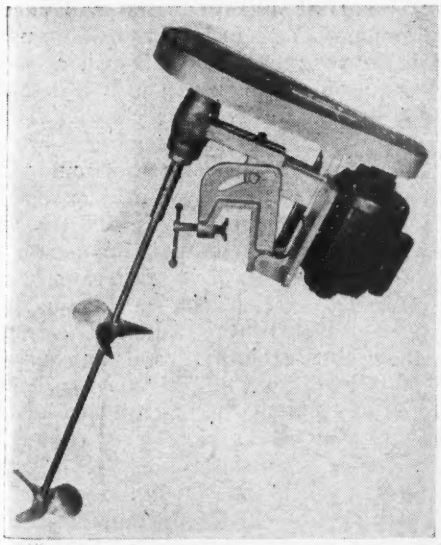
ALLIS-CHALMERS MFG. Co., Milwaukee, Wis., has announced the Type AO self-priming pump which is featured by an improved automatically controlled valve. The design and operation of the valve arrangement is stated to be an important factor in the quick and effective self-priming action of this pump.

In the future, a complete line of these Type AO pumps will be available from 1- to 6-in. sizes but at present only the 2-in. and 3-in. sizes are available. The entire line will range from small capacities up to 1,400 gal. per minute and for heads up to 100 ft. or over.

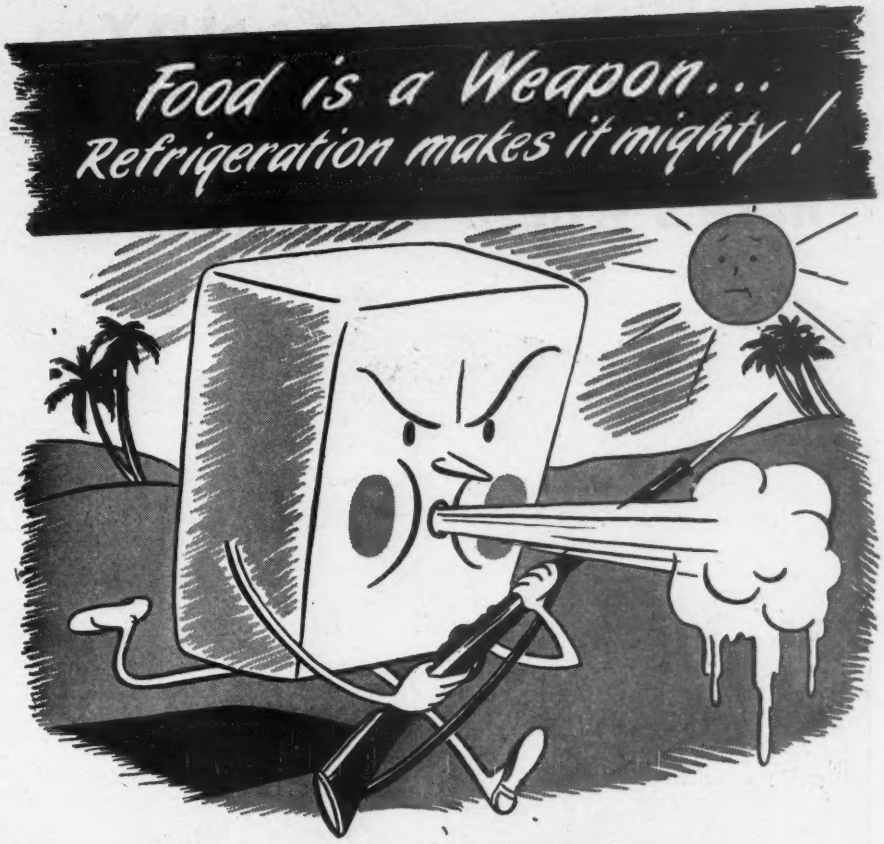
Portable Mixer

UNITED ELECTRIC MOTOR Co., 178 Center St., New York, has brought out a belt-driven type of portable mixer, in which the motor hangs outside of the tank in a protected position and the mixer shaft is driven by means of a V-belt drive.

This mixer can be driven by either



Portable belt-driven mixer.

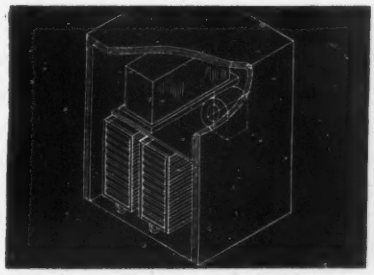


Refrigeration FIGHTS, too at Home and Abroad . . .

Wherever food goes—to home front workers and their families, overseas to fighters or to peoples of occupied countries—MECHANICAL REFRIGERATION has played an important role in preserving, processing, storing and delivering it safely . . . performing a wartime service vital to Victory.

But here at home, refrigeration equipment, already installed, must carry this wartime load. All of Vilter's new equipment produced today is earmarked for essential civilian uses carrying high priorities, and for the armed forces. Your task of maintaining present refrigeration efficiency, until all replacements are available, is one of Vilter's accepted responsibilities.

POST-WAR PLANNING . . . **We are ready NOW to help you with post-war plans in refrigeration. Utilize Vilter's know-how today, so that you will be ready for swift progress when V-day comes.**



VILTER FRIGID BLAST FREEZER

Vilter's most recent contribution to faster, more economical food freezing—available in three types, custom-engineered for your specific needs. Write for details.

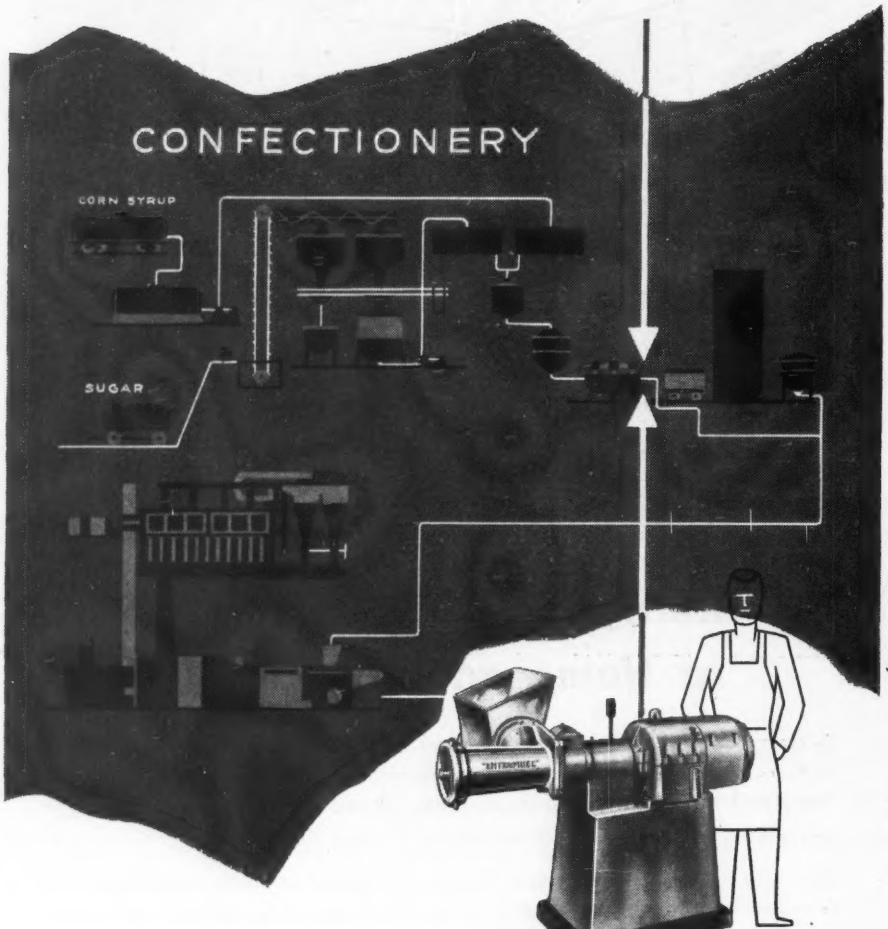
ARMY-NAVY "E"
A new star added — for continued excellence in war production.

Superior Since 1867
VILTER
Air Conditioning Refrigeration...

THE VILTER MFG. CO.
2115 S. FIRST STREET • MILWAUKEE 7, WISCONSIN
OFFICES IN PRINCIPAL CITIES

If you make fruit and nut **CANDY**
and want to make it better

here's where we come in–



Fruits aren't easy to cut, especially those with high sugar content . . . yet the Enterprise Master Chopper handles even the most difficult fruits with no difficulty. Does a wholly satisfactory job on nuts, too, cuts them cleanly to any desired size.

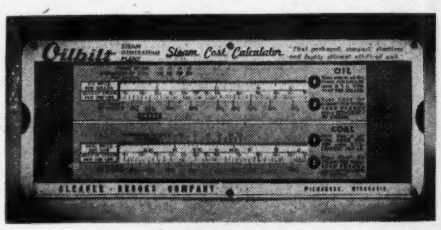
Not only candy-makers—but ice cream manufacturers, ketchup makers, bakers, packers, canners . . . all have found Enterprise Choppers help turn out a better product—*at a lower installation, operating and maintenance cost.* Enterprise is one of the oldest names in the food chopping business . . . a name you can trust with any problem. Our experts will answer your inquiries promptly. We welcome special problems in food reduction. Address Dept. 404

ENTERPRISE
MANUFACTURING CO. OF PA.
THIRD & DAUPHIN STREETS, PHILADELPHIA 33

a.c. or d.c. motors as desired and precise mixing speeds can be obtained by means of changing pulley sizes in the drive. The design is such that the balanced hanger carries the weight of the unit below the center of gravity, hence there is no necessity for great tension on the clamp to hold the mixer in place on the edge of the tank. Another advantage claimed for the mixer is that its lower speed and larger propeller decrease the time of mixing required with heavy liquids. Bearings are combination radial thrust type, to take care of both the radial load of the shaft and the thrust encountered in pushing heavy liquids up or down. The design is such that long shaft lengths can be provided where required for deep tanks.

Steam Cost Calculator

CLEAVER-BROOKS CO., Milwaukee 9, Wis., is distributing, without cost to readers of FOOD INDUSTRIES, a practical slide rule for figuring steam costs. This rule is prepared so that the cost can be figured for either coal or oil fuel in



Simple calculator for determining steam cost.

cents per thousand pounds of steam generated in relation to the cost per gallon or ton of the fuel and the efficiency of the steam generating system.

The calculator can be obtained by plant engineers or superintendents who request it on their business letterheads.

Fire Fighting Shield

AMERICAN-LAFRANCE-FOAMITE CORP., Elmira, N. Y., is making a shield for use in fire fighting, particularly where carbon-dioxide gas is used and it is desirable to fight the fire from close-up. The shield is built of steel reinforced with angle iron and between the front and back plate is placed a 1-in. blanket of insulating material. It is said to be capable of withstanding a temperature of 1,200 deg. F. A wheeled carriage is provided so that the shield can be readily moved into position. There are three observation ports and four nozzle ports, equipped with pivoted cover doors controlled from the rear of the shield. Anchoring chains are provided for holding nozzle pipes in place. At the base of the shield are three hinged skirts which gave way readily upon meeting unevenness in the ground. The dimensions are 79½ in. high by 75¾ in. wide.

ERECTION *know-how*

an important Armstrong EXTRA

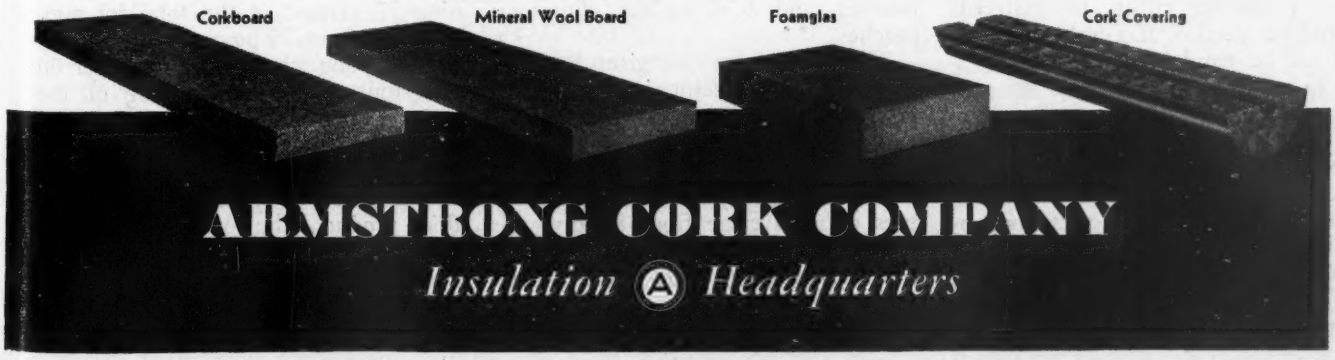
TWO THINGS make for lasting efficiency on any low-temperature insulation job . . . the efficiency of the insulating material itself, and the skill with which that material is erected. You get both when you specify "insulation by Armstrong."

At "Insulation Headquarters" you have a complete range of efficient materials to choose from—Armstrong's Corkboard and Cork Covering, Foamglas, and Mineral Wool Board. Thus you can be sure that Armstrong's engineers will specify the material best suited to your needs. Their recommendations will be sound because they have a background of over 40 years' experience in low-temperature insulation work.

The all-important extra you get is the complete follow-through that Armstrong provides *after* you've chosen a material. This is possible first, because Armstrong has offices and distributors spotted in strategic locations all over the country, and second, because all of these offices maintain complete crews of skilled mechanics who are specialists in erecting low-temperature insulation.

These experts have the know-how needed to meet any unusual problem of construction encountered on the job. When they erect insulation you can be *sure* the job is right—sure that it will deliver efficient, lasting service.

Remember this plus value the next time you consider insulation and bring your problems to "Insulation Headquarters." But don't wait until then to get the facts about Armstrong's Insulation. Write today! Armstrong Cork Company, Building Materials Division, 4212 Concord Street, Lancaster, Pennsylvania.



ARMSTRONG CORK COMPANY

Insulation Ⓐ Headquarters

What You Must Do To Get Plant Equipment

(Continued from page 75)

bol MRO and the preference ratings assigned by CMP Regulation No. 5 may not order more maintenance, repair or operating supplies for delivery during any one calendar quarter in an aggregate amount exceeding one-fourth of their aggregate expenditures for MRO during the calendar year 1942 (or during the fiscal year ending nearest to Dec. 31, 1942). However, persons engaged in seasonal business may use the allotment symbol and preference rating to order for delivery during any one calendar quarter up to but not in excess of their aggregate expenditure for MRO during the corresponding quarter of 1942 (or such fiscal year), but in no case may their annual expenditures exceed the aggregate expenditures made for MRO during the base period.

At the same time, it should be pointed out that Preference Rating Order P-115 assigns an AA-3 preference rating for deliveries of material for replacement or to increase efficiency of operations in plants which can or process fruits, vegetables or fish. Similarly, P-118 assigns an AA-3 preference rating to plants which engage in processing dairy products or eggs.

The effect of these two orders has largely been superseded by L-292, but they are still used to release small amounts of equipment on a non-programmed basis. Technically, they are not MRO regulations, but come into relationship to the minor capital addition phase of MRO procedures.

Construction

Industrial construction, including the food field, is governed by Limitation Order L-41.

This order requires that in most cases permission to start construction must be secured from the War Production Board. Even though the necessary materials are on hand or if you have ratings for materials, you may still have to get permission to use them for a particular construction work you contemplate. On the other hand, although permission to begin construction has been granted it may be necessary to secure preference ratings for materials for fixtures needed. If a utility connection will be required, it may be necessary to get WPB authority for the connection. Check with the utility company and if approval is necessary, get it before beginning construction even though the cost of the construction comes within the limits prescribed by L-41.

Industrial construction not exceeding $5,000 in cost does not require permission under Order L-41 except for beverages (excluding milk), candy and chewing gum, for which the cost limit is $200. Permission is not required for necessary maintenance and repair to keep a building in sound working condition and "the minimum work necessary to prevent more damage to a building or structure (or its contents) which has been damaged by fire, flood, tornado, earthquake, acts of war, or the like."

Whether or not priority assistance is required to obtain the materials, application for permission to start construction on factories, plants and other industrial units should be made on Form WPB 617 (formerly PD-200). If the total cost is less than $10,000, the application should be mailed to the WPB district office having jurisdiction over the site. If the total cost is more than $10,000, the application should be mailed to the War Production Board in Washington, D. C. For all other kinds of construction, use form WPB 2570 (formerly PD-200-C) for projects having a total cost of less than $10,000 and mail it to the WPB district office. For projects over $10,000 use Form WPB 617 (formerly PD-200) and mail to Washington, D. C.

In case of emergency, applications may be made by telegraph or in person, giving the following information.

1. Cause of the emergency (fire, flood, etc.)
2. What the building or structure is used for
3. Type of construction
4. Why immediate construction is necessary
5. Estimated cost of the construction

Minor capital additions under CMP Regulation No. 5 are excepted from the restrictions of L-41 except in the case of candy or chewing gum and beverages other than milk. Installation of plumbing equipment rated on WPB 2631 (formerly PD-851) is permitted if the cost is under $200.

Raw Materials

No attempt is made in this article to cover the raw material requirements of the food industry, in view of the fact that all concerned have long since had to become thoroughly familiar with all restrictions and allotments involved.

Summary

As previously noted, this article has attempted to bring all priority regulations, limitation and conservation orders applying to the food industry under one roof. There may be some omissions. There will unquestionably be changes in some of the orders discussed between the time of writing this article and the time it appears in print.

There is only one way to keep strictly up to date in these matters, and to make your own interpretation of orders affecting your particular business. That is to subscribe to the *Federal Register*, a daily publication of the government listing all regulations issued by the Federal government, including those covering priorities. This publication is furnished by the Superintendent of Documents, Government Printing Office, Washington, D. C., at an annual subscription rate of $15.

One other highly valuable publication is *Products and Priorities* published every four weeks by the War Production Board, sold also by the Superintendent of Documents at $2 per year.

Products and Priorities is a complete index of all priority regulations in effect and lists individual products alphabetically, giving the limitation and conservation orders which affect them. Data on all phases of the priority situation are provided. If you subscribe to the *Federal Register*, you will need *Products and Priorities* to implement your use of the former.

What It Costs To Dry Fruits

IT COSTS 6.25 cents to dry a pound of apricots, 4.42 cents to dry freestone peaches, and 6.34 to dry clingstone peaches.

These cost figures are given by Alexander Joss, instructor in agricultural economics and junior agricultural economist on the Giannini Foundation of the University of California, on the Berkeley campus. Joss obtained these figures as an average from 84 dry-yards during the 1942 season, where 3,915 tons of apricots, 8,197 tons of freestones and 1,377 tons of clings were handled.

Labor is the most important single item in the cost of drying, he finds, running 77 percent of the total for apricots and about 75 percent for freestone peaches. The labor cost was higher on clingstones, since the cutting of the fruit required more labor.

The average drying cost per ton of fresh apricots was $22.96, and 5.44 lb. was required to yield one pound of dried product. The cost of drying a ton of freestone peaches was $13.21, and they dried away at the rate of 6.69 to 1. Clings cost $17.41 per ton of fresh fruit and dried at the ratio of 7.29 to 1.

JUST OFF THE PRESS

BOOKLETS • LITERATURE • BULLETINS

FOOD PLANT EQUIPMENT

Compressors—Frick four-cylinder compressors in six standard sizes designed to meet the growing demand for large refrigerating machines and giving the advantages of enclosed-type construction are discussed in 16-page Bulletin No. 651-A, "Ice and Frost"; issued by Frick Co., Waynesboro, Pa.

Dehydrating Equipment—A diagram of the Miller semiportable tunnel dehydrater designed for the dehydration of fruits and vegetables, as well as illustrations of typical installations, are found in a catalog issued by L. N. Miller Dehydrater Co., Eugene, Ore.

Materials-handling Equipment — Lyon-Raymond trucks, and tables elevated hydraulically through hand, foot-operated or motor-driven hydraulic pumps, are illustrated and described in Circular 134 by Lyon-Richmond Corp., Greene, N. Y.

Proportioning Equipment—A method of proportioning sulphuric acid to water supplies, as well as numerous advantages and applications, is given in Publication No. 2985-A by Cochrane Corp., 17th & Allegheny Ave., Philadelphia 32, Pa.

X-Ray Equipment—For safe, rapid inspection work and for the prevention of sabotage and theft in industrial plants, the Norelco Searchray, Model 80, is described and illustrated in two 4-page pamphlets published by Industrial Electronics Division, North American Philips Co., Inc., 418 Fourth Ave., New York.

PLANT SUPPLIES

Draft Control—Draft-A-Justor, an automatic draft control device operated by barometric pressure to within 0.01-in. water gage, is described and illustrated in a 16-page booklet put out by Preferred Utilities Co., Inc., 1860 Broadway, New York 23.

Elevating Tables—Specifications of Lyon hydraulic elevating tables, and six ways to speed up work through the use of these tables, are given in a 4-page bulletin published by Lyon-Raymond Corp., Greene, N. Y.

Gaskets—A chart showing cross sectional diagrams of 36 types of gaskets, their uses and characteristics, has been published by Goetze Gasket and Packing Co., Inc., New Brunswick, N. J.

Lubrication—Of use to food plant engineers and production men interested in improving lubrication methods and practices is the booklet "What Makes a Grease," published by Sun Oil Co., Dept. 1, 1608 Walnut St., Philadelphia, Pa.

Motor Valves and Power Units—A 12-page booklet describing and illustrating B-C motor valves and power units for industrial furnaces, ovens, dryers and kilns, has been published in Bulletin V506 by Bristol Co., Waterbury 91, Conn.

Water Pumps — Deepwell turbine pumps, "Hi-Lift" pump and "Hydro-Foil" pump applications are illustrated by photographs in a bulletin entitled, "Peerless Pumps Serve All War Fronts"; issued by Peerless Pump Division, Food Machinery Corp., 301 W. Avenue 26, Los Angeles 31, Calif.

CONTROL EQUIPMENT

Control Instruments — Automatic controllers, recording thermometers, humidity instruments and other control and recording apparatus have been described and illustrated in a booklet, "Instruments for Automatic Control of War-Time Processes and Operations," by Bristol Co., Waterbury 91, Conn.

Flowmeters—Complete detailed instructions on how to install and maintain flowmeters are given in a 120-page reprint, "How to Keep Flowmeters Accurate," by William C. Bennett; issued by Cochrane Corp., 17th & Allegheny Ave., Philadelphia 32, Pa.

Frequency Meter—Diagrams and description of a 400-cycle vibrating-reed frequency meter are given in a leaflet published by J-B-T Instruments, Inc., 441 Chapel St., New Haven 8, Conn.

Speed Controls — Variable-speed controls, speed reducers and associated equipment are fully described, with illustrations and engineering data, in 128-page Catalog G-435, published by Reeves Pulley Co., 1000 N. Wilson St., Columbus, Ohio.

LABORATORY EQUIPMENT

Laboratory Equipment—Catalog 600, entitled "Laboratory Utilities," contains detailed information on laboratory apparatus and equipment such as autoclaves, centrifuges, stills, heaters, stirrers, titrating illuminators and many others; issued by Precision Scientific Co., 1750 N. Springfield Ave., Chicago 47.

Laboratory Equipment—Graduated cylinders, volumetric flasks, pipettes and many other Pyrex and Vycor laboratory glassware for public health laboratories are illustrated in a 4-page pamphlet, Form C-259, published by Laboratory & Pharmaceutical Division, Corning Glass Works, Corning, N. Y.

Testing Equipment—"Testing Equipment for Grain, Seed and Other Products" is the title of the 90-page illustrated Catalog 143 describing testing equipment for determining the moisture content of whole and processed grains and dehydrated foods, grain scales, samplers and other grain and seed equipment; issued by Seedburo Equipment Co., 223 W. Jackson Blvd., Chicago 6.

TRUCKS & TRACTORS

Fleet Maintenance — Twenty-one practical cleaning methods for food industry truck fleet operators to speed up repair, overhaul and general preventive maintenance work of transportation equipment, are described and illustrated in a 36-page booklet issued by Oakite Products, Inc., 26G Thames St., New York 6.

Tire Loads—A wall chart giving information on truck and bus tire loads and an inflation table for operators of trucks or busses in highway service, may be obtained from B. F. Goodrich Co., Akron, Ohio.

MISCELLANEOUS

Chemicals—The manufacturing processes of such products as monosodium glutamate, and glutamic acid, used in dehydrated foods and in certain Army rations, magnesium sulphate, fertilizer and potash, are described and illustrated through photographs in a 48-page manual, "Report of Progress," published by International Minerals & Chemical Corp., 20 N. Wacker Drive, Chicago.

Flavors—A wholesale price list of essential oils, aromatic chemicals, oleo resins, insecticide concentrates and other products has been published by Dodge & Olcott Co., 180 Varick St., New York.

Stainless Steel—"Welding Stainless Steels" is the title of a 64-page illustrated catalog, comprising an elementary, practical instruction manual on stainless steel welding which will be helpful not only to students and beginners but to production men, engineers and maintenance men; published by Allegheny Ludlum Steel Corp., Brackenridge, Pa.

Work Sheet—To help technologists solve specific corrosion problems, a work sheet for obtaining comparable and comparative corrosion-resistance data has been published by International Nickel Co., Inc., 67 Wall St., New York 5.

WE KNOW what you're up against, trying to issue uniforms to a bunch of rookies! You don't mind the size 38 who wears size 9 shoes. But that big 6 ft. 7 in. bruiser who weighs 340—man, oh, man! Or the squirt who wears a 5½ shoe—they drive a guy to distraction!

And in the salt business we've got to "fit" the salt to the job. Butter makers don't want large, slow dissolving crystals in Butter Salt. We remove the "big ones" so completely, you won't find even a trace on a 28-mesh Tylor screen. But they don't want fine dust, either, to cause pasting in the churn. Diamond Crystal Butter Salt contains only 3% of particles small enough to pass through a 65-mesh screen!

Yes, it's just as exacting for a salt producer to remove over-sized and under-sized salt crystals . . . as for the "top kick" to take care of his over-sized and under-sized rookies. If we know the average "top kick," however, he gets results and so do we at Diamond Crystal. That's why you can be sure of clean screening whenever you specify Diamond Crystal. Take your choice of grade or grain—it's tops by actual tests!

NEED HELP? HERE IT IS!

If *you* have a salt problem, let our Director of Technical Service help! Just address him in care of Diamond Crystal Salt, Dept. J-2, St. Clair, Michigan.

DIAMOND CRYSTAL
ALBERGER PROCESS **SALT**

PATENTS

Catsup Base Made to Have Increased Solids Content and Viscosity, Improved Color, Increased Natural Mineral and Sugar Content, and Lower Contamination With Mold Filaments, Insect Fragments and Bacteria Spores by Combining Unconcentrated Sugar Beet Pulp and Red Beet Pulp With Tomato Pulp—Charles R. Cooper, one-half to Augusta S. Cooper, San Francisco, Calif. No. 2,331,308. Oct. 12, 1943.

Liquids Subjected to Two-stage Centrifugal Purification by Passage Through Separate Zones in Same Centrifugal Rotor—Laurence Price Sharples, Ardmore, Pa., to Sharples Corp., Philadelphia, Pa. No. 2,331,352. Oct. 12, 1943.

Depilating Material for Edible Animal Carcasses Processed for Continued Reuse—Gene Abson, to Chicago Testing Laboratory, Inc., Chicago, Ill. Nos. 2,331,364 and 2,331,365. Oct. 12, 1943.

Cucumbers and Like Mechanically Sliced in Rotatable Drum Fitted with Chute to Guide Vegetables Individually to Series of Knife Edges on Interior Surface—Roy W. Lundquist, to Reid, Murdoch & Co., Chicago, Ill. No. 2,331,406. Oct. 12, 1943.

Selective Pouring of Milk or Cream Made Possible by Valved Separating Unit Inserted in Neck of Bottle—Emile Scheemaeker, Woonsocket, R. I. No. 2,331,426. Oct. 12, 1943.

Fat-soluble Vitamins Stabilized by Antioxidant Containing Acetyl Methyl Carbinol—Eric J. Simons, New York, N. Y., and Loran O. Buxton, Belleville, N. J., to National Oil Products Co., Harrison, N. J. No. 2,331,432. Oct. 12, 1943.

Zein Dissolved in Solvent Mixture of Ethylene Formal and Methyl Alcohol Containing Urea and Formaldehyde—Richard R. Sitzler, Cumberland, Md., to Celanese Corp. of America. No. 2,331,434. Oct. 12, 1943.

Flow of Corn Sirup and Similar Highly Viscous and Highly Adhesive Fluid Through Pipeline at Below Free-flowing Temperature Initiated by Circulating Similar Fluid at Readily Flowable Temperature Through Pipe at Pump Pressure—Paul H. Stambaugh, to Union Starch & Refining Co., Columbus, Ind. No. 2,331,435. Oct. 12, 1943.

Meat and Meat-base Products Contained in Can With Vent Hole Subjected to Temperature Range From 250 to 400 Deg. F. to Sterilize Contents and Evacuate Can of Air Content Prior to Sealing—Carroll L. Griffith and Stephan L. Komarik, to Griffith Laboratories, Inc., Chicago, Ill. No. 2,331,467. Oct. 12, 1943.

Water and Similar Liquids Having Intermittent Flow Given Uniform Automatic Sterilizing Treatment Just Prior to Use—Carl L. Trier and James H. Livingston, Baltimore, Md., to Cherry-Burrell Corp., Wilmington, Del. No. 2,331,518. Oct. 12, 1943.

Beer Wort Clarified by Centrifuging and Aerated While at Bacteria-killing Temperature and Under Greater Than Atmospheric Pressure Preliminary to Cooling to Fermentation Temperature Level—Hans Olof Lindgren, Appelviken, Sweden, to De Laval Separator Co., New York, N. Y. No. 2,331,556. Oct. 12, 1943.

Proteins Recovered From Vegetable Material by Adjusting Acidity of Aqueous Solvent to Isoelectric Point of Desired Protein and Selective Heating to Bring Protein Into Solution, Removing Solid Material and Subsequently Adjusting Hydrogen Ion Concentration of Solution to Precipitate Protein—Earle H. Morse, Nutley, N. J., to Reynolds Research Corp., New York, N. Y. No. 2,331,619. Oct. 12, 1943.

Completeness of Milk Fat Recovery as Butter From Churning Mechanically Determined by Taking Liquid-level Reading of Buttermilk in Churn Before Draining—James K. Conner, Minneapolis, Minn.; Emerson W. Bird, Ames, Iowa; and Charles F. Flakker and Oscar J. Johnson, Mandan, N. D., to Mandan Creamery & Produce Co., Mandan, N. D. No. 2,331,656. Oct. 12, 1943.

Grain Dried While Flowing Under Gravity Through Vertical Passage Fitted with Transverse Air Passages—Arthur B. Osgood, Minneapolis, Minn. No. 2,331,720. Oct. 12, 1943.

Oil Extracted From Cellular Materials Having Gelatinous Constituents—Frank B. Lachle, San Mateo, Calif., to Schwarz Engineering Co., Inc., San Francisco, Calif. No. 2,331,785. Oct. 12, 1943.

Fruits Preserved by Packing in Sirup Containing 25 Percent Dextrose From Acid Conversion of Starch and 30 Percent Dextrose Obtained by Subsequent Enzyme Conversion of Acid Converted Starch Sirup—Karl J. Seulke, to A. E. Staley Manufacturing Co., Decatur, Ill. No. 2,331,804. Oct. 12, 1943.

Milled Grains Classified for Granule Size by Passage Through Shower-producing Unit Fitted With Rotary Power-driven Cup to Impart Centrifugal Force to Each Particle According to Its Weight—William N. Smith, Great Falls, Mont. No. 2,331,850. Oct. 12, 1943.

Scales Removed From Fish by Mechanical Means—Michel P. Vucassovich, Beverly, Mass., to Gloucester Research Corp., New York, N. Y. No. 2,331,855. Oct. 12, 1943.

Heated Milk at 1,000 Lb. per Square Inch Pressure Sprayed Into Chamber Held at Subatmospheric Pressure to Deodorize, to Sterilize and to Cool Milk Preparatory to Packaging—Russell P. Dunmire, Alliance, Ohio, to Buckeye Laboratories Corp., Cleveland, Ohio. No. 2,331,895. Oct. 19, 1943.

Cheese Bulk-packaged in Tubular Paperboard-body Containers Having Paperboard End-closure Disks Held in Place With Hollow Inturned Beads, Diameter of Package Being Substantially Greater Than Depth—Guy Norwood Fisher, Wilmette, Ill., to Kraft Cheese Co., Chicago, Ill. No. 2,331,901. Oct. 19, 1943.

Print Butter Cut by Single Tool Used in Two Positions—John Fuest, Jr., Glendale, N. Y. No. 2,331,902. Oct. 19, 1943.

Solid Protein Material Heat-treated Under Pressure in Unit Fitted With Slidable Plateform Valve Actuated for Opening and Closing by Pressure-sensitive Mechanism—Andrew P. Holly, Memphis, Tenn., to V. D. Anderson Co., Cleveland, Ohio. No. 2,331,910. Oct. 19, 1943.

Sugar Extracted From Finely Divided Sugar Beet by Cold Mash Extraction Followed by Hot Juice Extraction—Thomas R. Cutler, Idaho Falls, Idaho. No. 2,332,062. Oct. 19, 1943.

Plastic Shortening Mix Made to Contain Equal Parts by Weight of Fat Melting at 115 to 120 Deg. F., Hydrogenated Vegetable Oil Melting at 140 to 160 Deg. F. and Dry Disrupted Starch—Enoch L. Griffith, to Griffith Laboratories, Inc., Chicago, Ill. No. 2,332,074. Oct. 19, 1943.

Fruits and Vegetables Peeled During Passage Through Rotatable Cylinders so as to Contact One or More Pairs of Peeling Rolls—Mark W. Lowe, Connersville, Ind. No. 2,332,093. Oct. 19, 1943.

Juice Extracted From Citrus Fruits in Continuous Manner in Atmosphere of Inert Gas—Ronald B. McKinnis, assigned to McKinnis Foods, Winter Haven, Fla. No. 2,332,098. Oct. 19, 1943.

Closure of Containers Filled With Food Sterilized by Infra-red Radiations—Ronald B. McKinnis, to McKinnis Foods, Winter Haven, Fla. No. 2,332,099. Oct. 19, 1943.

Fresh Fruit Given Protective Waxy Coating in Soap-containing Emulsion Made From Naturally Hard Water Treated With Sodium Hexametaphosphate to Prevent Precipitation—Irvin John Blondon, Pomona, Calif., to Brogdex Co. No. 2,332,128. Oct. 19, 1943.

Whole Fruit Protected From Decay by Treatment in Aqueous Solution Containing 0.3 to 3.0 Percent Available Chlorine and Alkali Metal Salt of Sulphated Anionic Agent—Arthur F. Kalmar, Riverside, Calif., to Food Machinery Corp., San Jose, Calif. No. 2,332,151. Oct. 19, 1943.

Juice Extracted From Fruit Pieces Contained in Pockets of Rotary Carrier Into Which Plunger is Forced During Operation of Rotary Eccentric—Henry L. Smith, Clearwater, Fla., to Food Machinery Corp., San Jose, Calif. No. 2,332,177. Oct. 19, 1943.

BOOKS

Public Relations

YOU AND YOUR PUBLIC. By Verne Burnett. Published by Harper & Brothers, 49 E. 33rd St., New York, N. Y., 1943. 194 pages; 5¾x8½ in.; cloth. Price, $2.50.

Two facts make this book of particular interest to food manufacturers. Firstly, it was written by General Food Corp.'s vice-president in charge of public relations. Secondly, good public relations are especially important to food processors because they have to deal not only with a consumer group including everyone in the nation but they have a public relations problem of first magnitude with the farmers, whose welfare is closely tied up with the prices food manufacturers pay for materials and the amounts they buy. Then there are employee problems, political headaches and local situations to worry about. In short, food-company management cannot be too well informed about the technics of good public relations.

This book is a guide to public relations—a practical guide written for easy reading and quick comprehension by one not versed in public relations. It covers all phases of the subject from knowing yourself to making speeches, treating of some two dozen angles in between. A highlight is the revelation of the public relations "secret." The secret is that for any public relations program first get the facts and the best advice available. Find out the mistakes which have been made and why; discover where there is progress and the reasons therefor. To get the clues to your problem, learn the answers to such questions as whom you want to reach, what various groups feel about your activity and why, what media can best reach these groups, who their leaders are and what words, causes or symbols appeal to them or antagonize them.

"In public relations you find the mightiest weapon of modern time."

Coffee Economics

THE WORLD COFFEE ECONOMY. By V. D. Wickizer. Published by Food Research Institute, Stanford University, Palo Alto, Calif., 1943. 258 pages; 6½x9¼ in.; cloth. Price, $3.

Constituting a timely survey of the evolving world coffee economy, this volume examines the aspects of the industry which bear on its current and postwar problems. It pays particular attention to Brazilian experience in attempting stabilization with national controls and discusses the new political importance of coffee in the affairs of the Western Hemisphere. It also appraises the significance and operation of the Inter-American Coffee Agreement and searches for answers to world coffee problems through international agreements.

Three main coffee problems may be singled out for special attention. The first is that annual consumption is relatively stable, while the supply is highly variable. The second concerns the excessive aggregate world supplies. The third, a wartime problem, relates to the effect on producing countries of the loss of the European market.

Fats and Oils Survey

FATS AND OILS IN THE WAR. By Karl Brandt. Published by Food Research Institute, Stanford University, Palo Alto, Calif., 1943. 60 pages; 6x9 in. Price 25 cents.

The strategic importance of fats and oils in modern war production makes the publication of this pamphlet a timely one. The reader is given the international economic picture of the consumption and distribution of these products, not only in view of their being essential foodstuffs, but as needed raw materials for wartime industrial processes.

The survey includes both peacetime and wartime statistics for such countries as the United States, the British Empire, Soviet Russia, occupied Europe, Japanese-dominated territory, and those nations in neutral territory.

Dairy Products

MILK AND MILK PRODUCTS. 3rd Edition. By C. H. Eckles, W. B. Combs, and Harold Macy, University of Minnesota. Published by McGraw-Hill Publishing Co., 330 West 42nd St., New York, N. Y., 1943. 413 pages; 6½ x 9¼ in.; cloth. Price, $3.

To the contents of previous editions the authors have added definitely established information and commercially accepted practices which make this edition of value to the dairy technologist as well as to the agricultural college student for whom it is designated as a textbook.

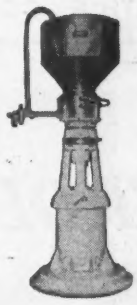
The real authors, Combs and Macy, were associated with the senior author during the preparation of the original edition and have carried through on the plan of that edition. They have purposely avoided inclusion of controversial subject material and debatable practices.

In addition to dealing with milk generally as a common food commodity, the authors treat it in its chemical, physical, biologic and economic aspects. They consider it as a raw material from which processed dairy products are

PLUS Your Product ... AND SHOW A GREATER PROFIT!

Original design of rotor and stator in

EPPENBACH COLLOIDAL MILL assures more efficient triple action.



AMAZING RESULTS have been achieved with the Eppenbach Colloidal Mills. Products, as wide apart as emulsions, serums, lipsticks, rubber compounds, have acquired new, improved qualities, because the Eppenbach is so far ahead in its triple action.

It's more powerful, the mixing turbines break liquids more violently. Clearances can be so finely adjusted, they seem practically closed. The teeth in the rotor and stator shear the materials mechanically—then the smooth surfaces hydraulically shear to any required particle size.

Perfect control is assured. No air is sucked in. Micrometric adjustments are made without stopping. Water jackets provide right temperatures. Rotor is only moving part—and it's conically shaped to take up wear. Self-cleaning, simple, rugged. *Write us.*

EPPENBACH
INCORPORATED
Processing Equipment for Over 30 Years
44-02 11th STREET
LONG ISLAND CITY, N. Y.

LECITHIN HEADQUARTERS of AMERICA

LECITHIN
for
FOOD
AND
TECHNICAL
PRODUCTS

ROSS & ROWE, INC.
75 Varick St. New York 13, N. Y.
Wrigley Bldg. Chicago 11, Ill.
SOLE SELLING AGENTS
FOR
AMERICAN LECITHIN CO.

YOUR problems today are those of war . . . tomorrow the competitive developments of peace. We are prepared to assist you along both lines and will be glad to work with you on any matter requiring the services of an independent laboratory of established reputation and broad experience.

FOOD ANALYSIS
VITAMIN DETERMINATION
Biological - Microbiological - Chemical
NUTRITIONAL STUDIES - RESEARCH
PRODUCT DEVELOPMENT
BACTERIOLOGICAL STUDIES
CONSULTATION (Labeling, Advertising)

We perodically issue Brochures on the latest scientific developments in connection with our Research work.

Send us your name, title, company address and we will be glad to add your name to our mailing list.

An Independent Laboratory
to meet the needs of Your Organization

LEBERCO LABORATORIES
36 Roosevelt Avenue, Bloomfield, N.J.

made and discuss it in relation to their manufacture.

A chapter is devoted to dairy arithmetic to acquaint even commercial plant operators with problems involving the application of simple mathematics; each problem dealt with represents a type encountered in practical dairy operations.

Publication of such a book at this time is doubly timely when milk and milk products are at such a high level of production and when new personnel is being trained to fill the places of those called into the armed forces.

New Dehydration Plant

(*Continued from page 85*)

Empty cans reach the filling operation by conveyor, either from a can storage on the first floor or directly from the railroad car. Filled cans also move away from the filling machine by conveyor to the closing station. The gas-packing method is employed and two American Can Co. No. 2 vacuumizing, gassing and closing machines are used for this purpose. Gas for the closing machines is CO_2, obtained from dry ice converters. At an average of four cans per minute, it is possible to pack 4,800 lb. of dehydrated carrots per hour.

Additional Facilities

Besides the processing facilities, this new dehydration plant includes a power plant having 1,000-bhp. capacity, employing ten gas-fired boilers; an ice manufacturing plant, for use in the shipment of fresh vegetables; complete maintenance facilities; a plant cafeteria serving 1,600 meals daily; and a well-equipped laboratory. Under the direction of Irene Breschini, the laboratory makes such control tests as the peroxidase test, moisture tests on fresh and dehydrated material, carotene tests, tests for the oxygen content of sealed cans, and also carries out experimental dehydration tests on products not now handled in the plant.

British Beverage Industry

(*Continued from page 88*)

the total cash received for his goods and the sum allowed him for manufacturing and selling costs. This last is known as his predetermined credit, and the standard for it was ascertained from data collated from a cross section of the trade. It serves a purpose in that it permits of no slack operation of plants. All operators naturally endeavor to beat the predetermined credit figure.

All cash received by the regional directors is paid into a pool fund. After association operating costs and certain other contingencies are provided for, members of the nation-wide association, whether they are producing or not, receive a quota share of the profits made.

The predetermined credit is the chief concern of the executive, for on that issue he stands or falls as a business man. He must keep his costs within the permitted margin, and he must do this with an old plant and inadequate or inefficient labor. If he gets a bad breakdown necessitating machine stoppage for a day or so, he cannot afford to lay off any labor because the workers would certainly not return to him. It is far from easy under present conditions in Britain to keep soft drink plants operating to capacity.

No new plants have been allowed to begin operation since hostilities commenced, and to obtain replacements is as difficult as taking a bone from a man-eating tiger. All equipment makers are fully occupied with war work, and the trade journals are full of advertisement promises for what will be done after the war. The need is today, and managers must improvise.

Old parts are searched out from scrap and sent to the maintenance shop (now run by a shadow of its former useful staff) where it may be found possible to build up the metal on worn parts and render them useful again. Reams of forms are filled up in the hope of obtaining permits for what few replacements are permitted, but no manager will rely upon getting them; instead he carefully watches his plant in order to apply the stitch in time. The grease gun and the oiler play a large part in his program of watchfulness.

Under the concentration plan certain equipment and containers from closed plants are available, which will help the industry through the war period. There are, however, many difficulties.

First, the borrowed plant equipment is sometimes in as poor a condition as that replaced, and it is obviously better not to cannibalize by stripping bits from one or the other. Motors must be of the same phase and voltage, and they seldom are.

Bottles may be of a bastard size and not suitable for the machine. The percentage of cullet (broken glass for remelting) made by the combination of worn plant equipment and inefficient labor is high and constitutes a headache for anyone working to a cost figure based on efficiency. There is no escape from this, and the only consolation is that the bottles are still fairly cheap and plentiful.

Trouble has sometimes arisen from inability to affix the new small label permitted except by hand—a costly

process. This was due to the fact that no label boxes were available which were capable of handling the peculiar shape and, even with a suitable label box, there was insufficient label surface for the pickers adequately to gum the ends. This difficulty was overcome by adapting old label boxes and building out the picker surfaces as far as possible.

Bottle-washer trouble is particularly acute in hard-water areas, and it has been found that the addition of a little more caustic to the detergent provides better lubrication for the submerged moving parts, but does not improve matters regarding scale deposit.

Coupled with plant problems are those pertaining to labor, which is extremely scarce for this industry. If reasonably efficient manpower were available, things would be better. But only the very old and the very young are available. The workers are inexperienced, and the first thing the unwary manager finds is that breakdowns have happened and the job is stopped.

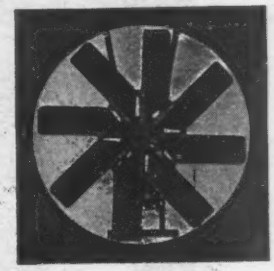
The best insurance against this is to train youngsters now. A boy learns a lot about the plant even if his job is only to see that every bearing is kept greased and, if his interest is aroused, he will become most useful to the maintenance man. Youngsters are also useful in checking tire pressures and batteries when the transport fleet is in.

In the box and crate makers department a similar tale can be told. Thousands of crates stand awaiting repair because the personnel is unable to keep up with incoming work. The trouble, however, is being overcome in some degree by the use of women and boys. It is interesting to watch the developing skill of women who start by holding the hammer close to the head and tapping gingerly at the nail. In a few weeks they are smacking them home in two clouts, using rusty nails at that.

Salvaged blitz material has to be used as far as possible. Because lumber from abroad is unobtainable, much use is made of timber taken from wrecked buildings. This is nearly always charred and full of nails which have to be extracted. The burned faces are milled in the shops. Old crates or those past repair are stripped of fittings, and the best of the timber saved for repair work. Under the plan, crates are loaned by the closed operator to the working operator; but the user must keep them in good repair. The utmost efficiency is necessary in the repair shops to keep within the permitted cost allowance allocated under the plan for this service.

The trade has had many difficulties to meet. But it has met them cheerfully and has managed in a way no one would have thought possible in peacetime. In cooperation with the government, it is helping the war effort and learning many new lessons.

INSURE FUTURE DELIVERY
. . . by placing orders NOW
for Coolair TRADE MARK
EXHAUST FANS
for SCIENTIFIC VENTILATION



While WPB Regulations do not permit us to accumulate a warehouse stock of Coolair Fans, our plant has been able, up to now, to make reasonably prompt shipment on all priority rated orders, but . . .

Because this favorable situation may not prevail at the time you plan to install Coolair Fans in your plant we suggest that you figure out the number of fans you will need to solve your ventilating and cooling problems and place orders now while the necessary materials and supplies are still available for manufacture.

CATALOG PAGES
Fan models, dimensions and performance data can be found
in SWEET'S
ASHVE GUIDE and
ELECTRICAL BUYER'S
REFERENCE

Should CMP Regulation 5 not cover your requirements, file form PD-1A with your nearest WPB Field Office. All orders must bear a priority rating of AA-5 or better.

AMERICAN COOLAIR CORPORATION
"Pioneer Manufacturers of V-Belt Drive Exhaust Fans"
3604 Mayflower Street Jacksonville 3, Florida

ROBINSON TRADE UNIQUE MARK EQUIPMENT
for the PROCESSING of
CHEMICAL • FOOD • PLASTIC
MATERIALS
Crushers, Pulverizers, Grinders, Reducers, Cutters,
Blenders, Mixers, Sifters, Attr. & Hammer Mills.
LITERATURE ON REQUEST
MERCER-ROBINSON COMPANY INC.
30 CHURCH ST. NEW YORK 7, N. Y.

NEW TIRES START IN THIS *Crown Cup!*

No... this has nothing to do with synthetic rubber!

It's real rubber latex which is collected deep in the forests of the upper Amazon in these "cups"... manufactured by Crown.

Millions and millions of these metal cups are being shipped to Brazil to be used in tapping the wild rubber trees in the tropical jungles. Early in 1944 the crude rubber collected in these Crown Cups will be moving down the Amazon... and heading for American tire factories.

It was a big order... and a big contribution to our wartime effort. And it's one more demonstration of how Crown is doing its part to keep America rolling toward Victory!

CROWN CAN COMPANY, New York • Philadelphia.
Division of Crown Cork and Seal Company,
Baltimore, Maryland.

CROWN CAN

FOOD TECHNOLOGY

NEW DISCOVERIES AND INVENTIONS

PACKAGING

Shortenings in Glass

WHITE shortenings, after aeration and chilling, showed relatively small light absorption when exposed in commercial clear glass jars. At intensities of light representative of average store illumination there was no change in peroxide value after 10 weeks' exposure, but specimens exposed in a window showed a characteristic and very pronounced flavor and odor change.

Accelerated exposure tests, with artificial light having energy distribution characteristics approximating solar light, indicate that the effective radiation is in the range from 325 to 460 millimicrons. Light above 460 millimicrons has little effect. The radiation below 325 millimicrons is not important in ordinary daylight, and is negligible from a commercial standpoint, since it is screened out by ordinary jar or window glass.

Certain commercial amber glass jars, screening or filtering out light below 450 or 500 millimicrons, protected white shortening from flavor and odor changes even after 200 hours of exposure in the accelerated-test apparatus. Blue, green and opal glasses do not have suitable screening effects.

The change in shortening due to light exposure is not a development of rancidity through auto-oxidation, since the peroxide values remained relatively low even in samples which had suffered a marked change in flavor and odor.

Digest from "Some Factors Pertaining to the Packaging of Shortening in Glass," by A. R. Gudheim, *Oil & Soap*, vol. 20, 197-201, October, 1943.

Waterproof Labeling

WATERPROOF adhesives are now available. These are nonstaining, corrosion-proof, and can be run on standard labeling equipment. A hot melt pick-up resin is also available for spot labeling, with similar properties. Labels are varnished on both sides to prevent expansion when wet.

Standard can labels and labeling adhesives have been found to fail within 3½ hours on salt water immersion, and hygroscopic types of lap paste and cold pick-up gum promote corrosion of the cans.

The waterproof labels and adhesives, applied in ordinary can labeling machines, withstood 7 days in a 5 percent sodium chloride solution at room temperature, followed by air drying. Labels were somewhat wrinkled but firmly adherent after the test.

The additional cost of waterproof labeling is estimated as approximately one and a half cent per case of 24 No. 2 cans.

Digest from a report by Gerard B. Cloran, issued by the Technical Service Laboratory, National Adhesives Division, National Starch Products Inc., October, 1943.

VITAMINS

Vitamin Recovery During Flour Milling

SAMPLES of all the flour and feed streams of a large Canadian flour mill were assayed for thiamine, riboflavin and niacin, in such a way that it has been possible to report an overall vitamin balance on the milling process. It is interesting that approximately 95 percent of the thiamine, 92 percent of the riboflavin and practically all of the niacin of the original wheat are accounted for in the flour and offal streams, the variations being due to inherent discrepancies in assay methods. The report includes detailed studies of the streams making up the various flours.

Niacin is concentrated largely in the branny layers, 48 percent of that in the wheat being recovered in the bran stream and 29 percent in the shorts. Dissection methods showed that the maximum concentration of thiamine is in the scutellum, about 40 percent of the total of the wheat being recovered in the shorts and 18 percent in the bran.

Riboflavin is more evenly distributed throughout the kernel, the first patent flour containing 20 percent of the total, with 22 percent in the bran and 23 percent in the shorts.

Increase of thiamine in the flour through changes in milling process will not necessarily be accompanied by increases of riboflavin and niacin. The riboflavin would not necessarily increase because there is no single part of the wheat kernel which contains the major portion of the riboflavin and which could be incorporated in the flour by any milling procedure change. Niacin also cannot be increased through changes in milling procedure, because it is contained largely in the outer bran layers which must be discarded if the flour is to be generally acceptable.

Digest from "The Recovery of the B Vitamins in the Milling of Wheat," by S. H. Jackson, A. Doherty and V. Malone, *Cereal Chemistry*, vol. 20, 551-59, September, 1943.

STORAGE

Ripening of Apples

ETHYLENE given off by rather ripe apples can accelerate the rate of ripening of a less ripe lot stored in the same chamber. There is no effect by one lot on the other when both are at the same stage of ripeness, as when picked and stored in prime condition for storage or when "tree ripe." The accelerated ripening effect may occur whenever apples of unlike ripeness, whether of the same or different varieties, are stored in the same room.

The problem involved is important. As much as 50 percent of the storage life of the less-ripe fruit may be lost, and an average of 25 percent loss was found in a series of tests. A relatively small proportion of ripe apples, possibly as little as one percent, may be effective. In extreme cases there may be injury to the skin of the apples, characterized by a yellowish brown spot.

It is known that scald may also be increased in some cases by gases from ripe fruit. There is not yet sufficient data available for a report on this phase of the problem, but investigations are continuing.

Digest from "One Lot of Apples May Affect Another in Storage," by R. M. Smock, *Farm Research*, vol. 9, 3, October, 1943.

BAKING

Bakery Tests with Frozen Egg Whites

COMMERCIAL thin frozen whites, resulting from mechanical treatment or from aging of the egg whites, either naturally or artificially, produced better foam and better angel cakes than thick frozen whites. Both types whipped better than fresh No. 1 quality whites.

Whipping is most satisfactory with the whites at 70 deg. F., and the resultant cakes are more tender, with better texture.

Baking temperatures of 400 to 425 deg. F. are recommended, on the basis of tenderness and palatability tests.

Palatability scores for cakes made from the fresh whites were very slightly, if any, higher than those for cakes made with the frozen whites.

Digest from "Angel Food Cakes Made from Fresh and Frozen Egg Whites," by E. L. Miller and G. E. Vail, *Cereal Chemistry*, vol. 20, 528-35, September, 1943.

MEAT

Measuring Juiciness

MECHANICAL determination of juiciness of meat samples, avoiding the uncertainties of organoleptic ratings, is possible through measurement of the juice expressed under controlled conditions. A specially adapted laboratory hydraulic press is used. Pressure on a 25- to 35-gram sample is increased gradually until it reaches 9,800 lb., and is held at that figure for 5 minutes. A temperature of 50 deg. C. is maintained in the test apparatus. The difference in weight of the sample before and after expressing the juice is taken as a measure of the juiciness.

The expressed juice may be collected in a Babcock milk testing bottle, to be used for fat determination, if desired.

Checks were obtained between results for corresponding samples, and there was a high degree of correlation with results of panel testing.

When samples of meat having the same percentage of expressible juice were tested by the judges, beef was rated the most juicy and pork the least.

The method appears to be suitable for beef, lamb and pork when the variation in juiciness is due to animal production factors or to the internal temperatures to which the meat is heated in cooking.

Digest of "Mechanical Determination of the Juiciness of Meat," by B. Tanner, N. G. Clark and O. G. Hankins, *Journal of Agricultural Research*, vol. 66, 403-12, June, 1943.

DAIRY PRODUCTS

Standards for Homogenized Milk

LACK of definite instructions for temperature of gravitation, and for the method of removing the upper 100 c.c. of milk from the bottle, make determinations of compliance with the U. S. Public Health Service definition of homogenized milk difficult.

It is suggested that the definition be stated in terms of a modified Farrall index, which is based on direct microscopic determination of the size of the fat globules. The gravitational method could be specified as an approximate method for use by those not equipped for determining the Farrall index.

Data are presented to show the variations which occur in applying the gravitational method. With skilled operators, variations as high as 100 percent of the USPHS index were found for the commonly used methods of removing the upper 100 c.c. sample from gravitated quart bottles, and values differed 25 or 30 percent when the storage temperature was 32 or 50 deg. F, instead of 40 deg. Suggested specifications for the gravitational method include use of a "siphon-opening-up" and 24-hour storage at 40 deg. F. before testing.

Digest from "A Critical Study of the United States Public Health Service Definitions for Homogenized Milk with Some Recommendations," by F. J. Doan and R. W. Mykleby, *Journal of Dairy Science*, vol. 26, 893–907, October, 1943.

Cheese Starters

STANDARD activity ratings and a heat tolerance figure, both to be determined under specified conditions, should be stated for each commercial starter for making American Cheddar cheese from pasteurized skim milk. Requirements

How Metso Cleaners Prevent Waste
CONSERVE TIME
Food processing plants of all varieties vote Metso Cleaners real friends of economy. They are pleased with the prompt action in emulsifying oils and greases, and can measure the time saved.
A leading bakery, for instance, shortened the cleaning schedule for washing bread pans by hours. And a tidy sum was saved too because Metso is priced as a basic raw material.
Have you a cleaning operation in your plant that could be speeded up? Write us now.
PHILADELPHIA QUARTZ CO.
General Offices and Lab.: 125 S. Third Street, Phila., Pa.
Chicago Sales Office: 205 West Wacker Drive
Sold in Canada by National Silicates, Ltd.
Distributors Stocks in over 60 cities
METSO
METSO CLEANERS

FOR
SIFTING
B.F. GUMP CO.
BAR-NUN
SIFTER
BAR-NUN Rotary SIFTERS
Tops in sifting efficiency is yours with a BAR-NUN on the job! If you process a vital dry, powdered or granular material, investigate this modern Sifter NOW! Learn how its complete rotary motion, mechanically controlled, produces thorough, uniform separations. Unusually large capacity. Bar-Nun Rotary Sifters are built in 9 sizes, 4 to 60 sq. ft. of cloth surface.
COMPLETE INFORMATION ON REQUEST
B. F. GUMP CO. 454 S. Clinton St. Chicago, Ill.
ENGINEERS AND MANUFACTURERS SINCE 1872

differ according to the practice of the individual cheese makers.

Data are presented for three commercial starters. Acid development in 8 hours was negligible in samples held at 60 deg. F., increased to half the maximum at 77 deg., reached the maximum value for those held between 85 and 90 deg., fell off to half the maximum at 95, and was again insignificant at 100 deg. F. There was considerable difference in the rate of development of acidity by the three starters, the differences remaining nearly constant throughout the period of test.

Scalding at 102 deg. F. had a very definite retarding effect on the subsequent acid development at 86 deg. F. Within the range usually found in cheese factories, the acidity of the fresh starter had little effect on the rate of acid development.

Digest from "Factors Affecting the Development of Acidity in Pasteurized Skim Milk Inoculated with Commercial Lactic Starters," by N. S. Golding, H. Amundsen and R. O. Wagenaar, *Journal of Dairy Science*, vol. 26, 909–919. October, 1943.

Butter Flavor Defects Due to Bacteria

DESTRUCTION of odor and flavor through decomposition of diacetyl in the aqueous phase precedes the stage in which there is development of putrid or cheesy flavors in laboratory churned butter contaminated with *Pseudomonas putrefaciens*. In butter made with starter the action of *Ps. putrefaciens* is inhibited, probably due to lactic acid formation. *Streptococcus lactis* is known to inhibit *Ps. putrefaciens* in butter.

In commercial butters, factors such as the method of working, printing, storage and distribution influence the activity of the microorganisms involved. Neither salt nor starter definitely insures the inhibition of *Ps. putrefaciens*. The sequence of changes is the same as in the laboratory churned samples, and it is probable that flat favor due to bacterial destruction of diacetyl is more common in commercial butter than is generally recognized.

Digest from "Effect of Growth of *Pseudomonas putrefaciens* on Diacetyl and Flavor of Butter," by P. R. Elliker and B. E. Horrall, *Journal of Dairy Science*, vol. 26, 943–49, October, 1943.

Evaporated Milks with High Total Solids

EVAPORATED milk of approximately 32 percent total solids can be sterilized without coagulation if it is made by the usual commercial procedure, but with a high-temperature short-time forewarming treatment. It is recommended that

DARNELL CASTERS

They reduce the overhead that is underfoot and materially increase employee efficiency

Write for FREE MANUAL

DARNELL CORP. LTD., 60 WALKER ST., NEW YORK, N.Y
LONG BEACH, CALIFORNIA, 36 N. CLINTON, CHICAGO, ILL

CHECK BACTERIAL CONTAMINATION WITH

HTH PRODUCTS!

Microbes don't sleep. They're on the go every minute, every hour of the day and night. They live only to eat—and to multiply by the billions! To make matters worse, these tireless saboteurs are invisible to the naked eye. They go about their work of destruction unseen and unannounced.

You can "hold the line" against bacterial contamination of valuable food stocks, beverages and dairy products by using Mathieson HTH Products in your plant. HTH, HTH-15 and Lo-Bax are full strength chlorine sterilizers — in convenient dry form. When added to water, they form dependable, fast-killing germicidal solutions. They minimize spoilage losses . . . guard against mold...protect the purity and quality of your products.

Use HTH Products freely to flush, spray or wipe all surfaces with which foods and beverages come in contact. You'll find them economical...easy to use. Write today for complete information on Mathieson HTH Products.

Solutions made from HTH Products are also ideal sanitizing agents for use in cafeterias, locker rooms, washrooms, etc.

MATHIESON HTH PRODUCTS

ARMY NAVY

THE MATHIESON ALKALI WORKS (INC.) 60 EAST 42ND STREET, NEW YORK, N. Y.

MATHIESON CHEMICALS

HTH PRODUCTS . . . NUFOS . . . DRY ICE . . . CARBONIC GAS . . . CAUSTIC SODA . . . AMMONIA, ANHYDROUS and ACUA . . . SODA ASH . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . PP-PLUS . . . SYNTHETIC SALT CAKE . . . SODIUM CHLORITE PRODUCTS

a good milk be forewarmed to about 248 deg. F., with a 3 to 4 minute holding time.

In test runs, whole milk which was forewarmed at 230 to 302 deg. F. by heating quickly and holding from ½ to 5 minutes, depending on the milk, showed much greater heat stability when concentrated to 26 percent solids or higher than did milk conventionally forewarmed at 203 deg. F. for 10 minutes.

Digest from "The Effect of Various Degrees of Forewarming Upon the Heat Stability of Milks of Different Solids Concentrations," by B. H. Webb, R. W. Bell, E. F. Deysher and G. E. Holm, *Journal of Dairy Science*, vol. 26, 571-78, July, 1943.

FATS AND OILS

Commercial Antioxidant For General Use

PHENOLIC and acidic type stabilizers must be included in an antioxidant preparation for general use. To be effective in the fat portion of processed foods, the stabilizer should be dissolved in an oil base, the base itself having antioxidant properties. To be acceptable to the Food and Drug Administration, both stabilizers and carrier must be naturally occurring, nontoxic substances without deleterious effect on the flavor, color or texture of the food to which they are added.

Wheat germ oil extracted with ethylene dichloride supplies tocopherols, lecithin and other stabilizing substances, and does not affect the flavor, color or texture of foodstuffs. This base has been fortified with citric acid, since citric acid duplicates results obtained with ascorbic acid. A concentration of 5 percent citric acid (monohydrate) is used, no acid separation from the mixture occurring down to 32 deg. F.

The antioxidant preparation is now in commercial production. Results of a commercial-scale test, with the antioxidant added to lard before rendering, follow: Modified Swift stability of the raw lard was 65 minutes and peroxide value (ferric thiocyanate method) 61.8 milli-equivalents per kilogram after aging 30 days. Addition of 0.055 percent of the new stabilizer increased the Swift stability to 190 minutes and reduced the peroxide value to 14.6. Finished lard, unstabilized, gave corresponding values of 60 minutes and 87.1 milli-equivalents. Comparable values for finished lard with 0.055 percent stabilizer were 105 and 23.7.

Details of the test method and of various stability tests are given.

Digest from "The Development of a Practical Antioxidant for Lard and Shortening," by A. Lips and W. D. McFarlane, *Oil & Soap*, vol. 20, 193–96, October, 1943.

COMPLETE DECAL PROGRAM *Wins* DEALER ACCEPTANCE!

Southern Dairies
60 M STREET N. E.
WASHINGTON, D. C.

October 1, 1943

Mr. Mercer Bowers
The Meyercord Company
3701 North Broad Street
Philadelphia, Penna.

Dear Mr. Bowers:

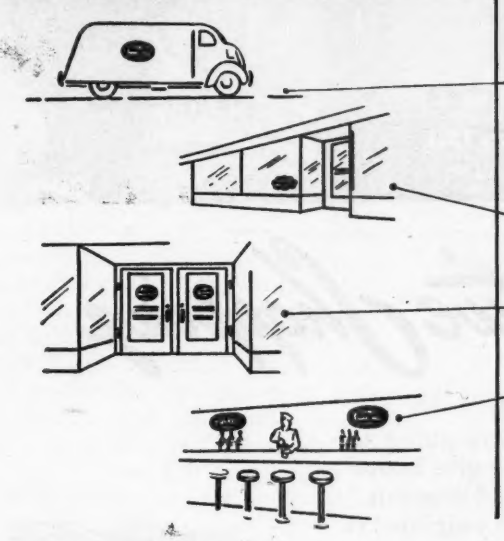
When you were here the other day we were discussing the matter of the use of decals on trucks and at stores. I was recalling to you the number of years which Southern Dairies has very satisfactorily used decals for these purposes.

Our top of window valances which you made for us this year looks exceptionally good, and are getting a very fine reception from our dealers. We have used these valances, as you know, for the past eight or ten years, and they have given us an excellent identification at a very low cost. In addition, we have complemented these top of window decals with smaller trademark decals for windows, doors and backbars.

On our fleet of several hundred delivery vehicles we have had a number of changes in the past ten years and have used various types of decoration, both hand lettered and decal. We find that it is much easier for us to definitely standardize the decoration on our vehicles by means of decals.

Yours very truly,
SOUTHERN DAIRIES, INC.

Geo. L. Smith
General Sales Manager



Don't let media restrictions throw your advertising plans out of balance. Meyercord Decal signs can be integrated into a complete campaign of brand identification effectively . . . at low cost. (Read Mr. Smith's letter for proof!) Decals are durable, full-color, lustrous, washable, easy to use and require no critical metal. Decal signs are night-and-day, all-weather, out-of-the-backroom "point-of-sale" advertising that pack more publicity value per square inch for a longer period of time at lower cost. Have you paced the many modern uses of genuine Meyercord Decalcomania? For top-of-the-window valances, window and door signs, truck lettering, road signs, back-bar and show case signs? Use Decals in your next advertising program. Write for details to Dept. 6512

Ten privilege panels (as illustrated) to fit the dealers business were used in the above valance program. Panels can be designed to fit any type of business desired.

MEYERCORD DECALS

THE MEYERCORD COMPANY

5323 WEST LAKE STREET • CHICAGO 44, ILLINOIS

PLUS VALUES FOR *Selective Shopping*

Only clean, wholesome meat can carry the Government stamp "U. S. Inspected and Passed." To the housewife, this is a standard of quality—indicating that she is getting the highest possible value for her money, and ration points.

In these days, when every penny must be spent carefully to ensure healthful living, shoppers are buying by recognized standards. They know the importance of providing diets rich in essential vitamins and minerals, and they are reading label statements—selecting those products which give them the best nutritional value for their money.

Preference everywhere is going to those food products that give housewives "added vitamins and minerals." This simple statement on your label is a powerful point-of-sale appeal that makes *your* product a *preferred* product.

Obtaining this preference usually is not difficult nor expensive. The Merck technical staff and laboratories offer assistance in ensuring adequate distribution and retention of the vitamins and minerals, and in product control methods.

We will gladly put our facilities to work to help you gain the preference of selective shoppers for *your* product.

MERCK & CO., Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

New York, N.Y. · Philadelphia, Pa. · St. Louis, Mo. · Elkton, Va. · Chicago, Ill. · Los Angeles, Cal.

In Canada: MERCK & CO. Limited, Montreal and Toronto

FORMULAS FOR FOODS

FORMULA NO. 438

Liver and Bacon Loaf

Fresh or frozen pork livers	50 lb.
Veal trimmings	10 lb.
Pork cheek meat	15 lb.
Regular pork trimmings	10 lb.
Skinned bacon ends or heavily smoked belly trims	15 lb.
Dry milk solids*	8 lb.
Shaved ice	8 lb.
Fresh onions	3 lb.
Salt	2 lb. 8 oz.
Nitrite of soda	¼ oz.
White pepper	6 oz.
Ground celery seed	2 oz.
Mace	2 oz.
Sweet marjoram	1½ oz.
Lemon extract	1 oz.

* Not over 1½ percent fat.

Directions

If fresh livers are used, they must be slashed and washed in several changes of cold water. Frozen livers do not need washing.

Grind the livers and onions through a ⅛-in. plate. Grind the veal and the pork separately through the same size plate.

Chop the liver fine in a silent cutter, then add the veal, pork, dry milk solids, shaved ice and spices, continuing to chop until all the mixture is fine. Add the bacon ends or smoked belly trimmings and chop a few revolutions, just enough to give a diced or cubed effect.

Put the mixture into pans lined with sliced bacon, and cover with bacon strips. Place lids on pans. Cook for 3 to 3½ hours at 165 to 170 deg. F. The inside temperature must not be less than 154 deg. F.

Chill overnight. Stuff in cellulose casing or wrap in transparent wrapper.

Formula from American Dry Milk Institute.

FORMULA NO. 439

Short Bread Cookies

Soft wheat flour	70 lb.
Soya flour	30 lb.
Sugar	45 lb.
Shortening	40 lb.
Salt	1 lb. 8 oz.
Soda	8 oz.
Spice mixture	8 oz.
Molasses, good flavor	25 lb.
Standardized invert sugar	3 lb.
Whole eggs	4 lb.
Water	1 lb.
Ammonia	8 oz.

Discussion

This formula has been developed for use with a rotary shortbread machine. The soya flour should be "full fat." The shortening preferably should be part butter, or butter flavor can be added very sparingly. Molasses must be selected so as to have a fine flavor.

The amount of eggs and water used must be kept within narrow limits, so that the dough will hang together but is dry enough to break like putty when a piece weighing about a pound is molded by hand into a ball and broken apart.

By observing these precautions a very crisp, short cooky should be produced.

The spice mixture suggested is:

Cinnamon	3 oz.
Ginger	1 oz.
Nutmeg	2 oz.
Mace	1 oz.
Cloves	1 oz.

Mixing Directions

Blend all the dry ingredients thoroughly. Stir together the molasses, standardized invert sugar and eggs. Dissolve the ammonia in the water. Add these two solutions to the blended dry ingredients and mix until evenly incorporated.

Allow the dough to rest about one-half hour before putting it through the rotary machine.

Bake at about 450 deg. F.

Formula from the Nulomoline Co.

FORMULA NO. 440

All-Purpose Sponge Cake

Fine granulated sugar	5 lb. 8 oz.
Whole eggs	4 lb. 8 oz.
Egg yolks	3 lb. 12 oz.
Corn sirup	8 oz.
Salt	2 oz.
Soda	¼ oz.
Cake flour	7 lb. 8 oz.
Baking powder	4 oz.
Vanilla extract	1 lb. 10 oz.
Water	2 lb. 10 oz.

Directions

Have the ingredients at 80 to 85 deg. F. Mix the sugar, eggs, corn sirup, salt and soda on second speed for about 20 minutes, until a light foam develops. If necessary, put a hot-water jacket on the mixer bowl to keep the egg and sugar mixture at the right temperature.

Add 1 lb. of water at 85 deg. F. and continue mixing on low speed.

Sift the cake flour and baking powder together, and add these slowly, immediately after adding the water. As soon as the batter is smooth, add the vanilla, dissolved in the remainder of the water. Mix only a few turns on low speed. Finish to a smooth batter by hand.

Scale and bake immediately after mixing. Bake at 380 to 390 deg. F., the time depending on the size of the cake.

This may be used for shortcakes and for jelly rolls. For Boston cream pie use layers baked in deep pie tins, split each layer into two thin layers, and use a cooled, cooked cream filling between the layers. French custard cream filling, Formula No. 435, is good for this purpose. Dust the top with powdered sugar to finish.

Formula from General Foods.

FORMULA NO. 441

Mulligatawney Soup Cubes

Sago flour	32 lb.
Rice flour	32 lb.
Dried onions, chopped fine	10 lb.
Tomato powder	4 lb.
Salt	10 lb.
Curry powder	1 lb.
Cayenne	1 oz.
Beef stock	10 lb.
Beef extract	10 lb.

Directions

Place all the ingredients, except the beef stock and beef extract, in a steam-heated kettle, fitted with a stirrer. Heat and stir continuously.

Dissolve the beef extract in 5 lb. of boiling water, add the beef stock, heated, and drip slowly into the dry mixture, continuing to heat and stir until dry.

Press into cubes and wrap.

Formula from H. B. Cronshaw, Surrey, England.

Concerning Formula 428

We have received the following letter, which is self-explanatory. The editors always appreciate letters such as this calling attention to any information which may possibly be misleading.

"I HAVE NOTED in your October, 1943, issue of FOOD INDUSTRIES under your department, "Formulas for Foods," an item on whipped butter spreads.

"I am sure that you would wish me to tell you that if these products are shipped in interstate commerce they will probably violate the Food, Drug and Cosmetic Act and possibly various state laws. In addition, the whipped butter spread may be violative of the Internal Revenue law.

"Reference:—Food, Drug and Cosmetic Act, Section 402 (b) (2) and (4) and the Act of Congress of March 4, 1923, estabishing an 80 percent butter fat minimum for butter."—W. R. M. WHARTON, *Chief, Eastern District, Food and Drug Administration.*

What you want to know about

Myva-dry
Vitamin A Powder

The answer to A-fortification of foods that cannot use oil concentrate

●

Q. WHAT IS MYVA-DRY?

A. Myva-Dry is a dry powder containing distilled concentrate of vitamin A. It is a new form that makes possible the A-fortification of a host of food products that cannot assimilate an oil concentrate.

Q. IS MYVA-DRY AS STABLE AS OIL CONCENTRATE?

A. Yes, and then some. DPI's research laboratory reports that Myva-Dry has the highest stability of any commercial source of vitamin A—liquid or solid—that it has yet measured. The difficulties of preparing a stable powder have been solved with an unexpectedly high margin—a margin that means smaller "overages" to guarantee claimed vitamin value.

Q. DOES MYVA-DRY HAVE ANY FLAVOR OR ODOR?

A. In its concentrated form, Myva-Dry does have a slight flavor and odor, typical of foods but not of marine oils. After incorporation in a food, this taste tinge is totally lost, and Myva-Dry cannot have the slightest effect on flavor of the most delicate food product.

Q. HOW ABOUT INCORPORATION CONTROL?

A. That's easy. Produced in uniformly fine, pulverized form, Myva-Dry blends perfectly with powdered foods and beverage powders. Protective carrier of the dry vitamin A concentrate is an edible, nutritious vegetable powder, and the vitamin A concentrate is evenly dispersed through this carrier for smooth, convenient incorporation.

Q. WHERE CAN I GET COMPLETE INFORMATION AND PERFORMANCE DATA?

A. If you have a product that may profitably share this new vitamin discovery, write Distillation Products, Inc., Rochester 13, New York, for full particulars. You'll receive detailed information, and the cooperation of DPI's famous Service Laboratory.

DP INC

DISTILLATION PRODUCTS, INC.

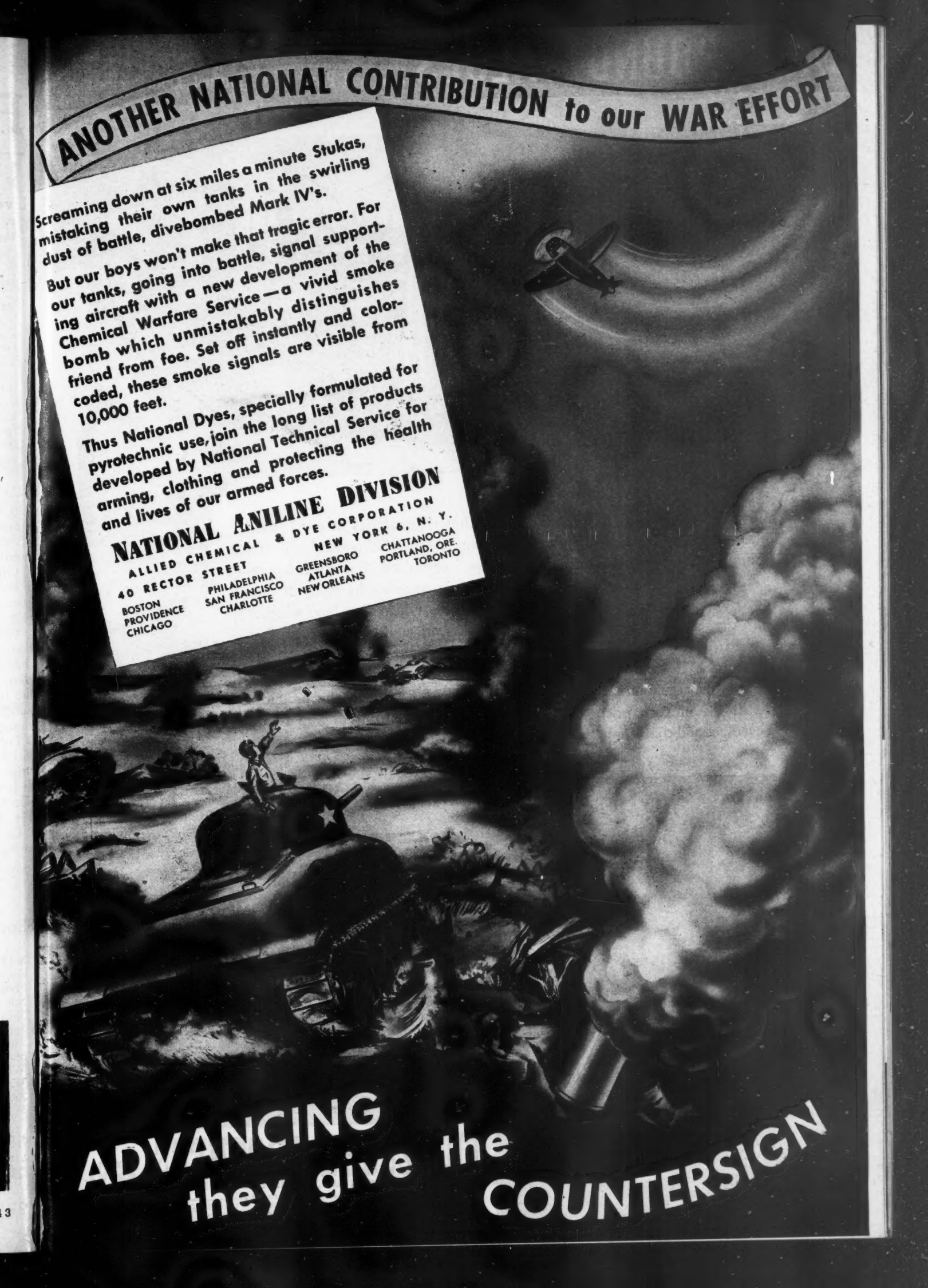
755 RIDGE ROAD WEST, ROCHESTER 13, NEW YORK

Jointly owned by EASTMAN KODAK CO. and GENERAL MILLS, INC.

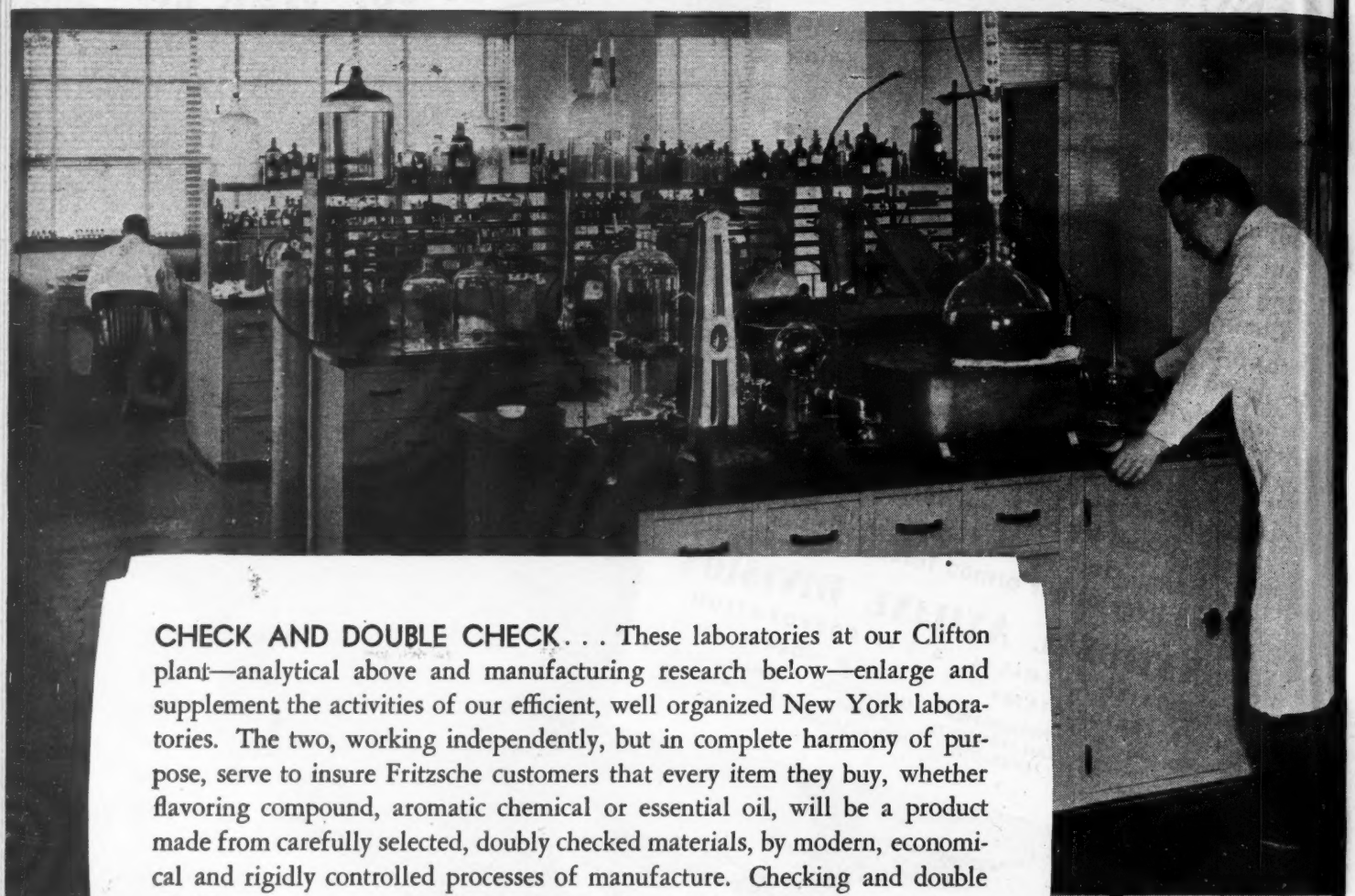
Sales Agent:

Special Commodities Division, General Mills, Inc., Minneapolis 15, Minn.

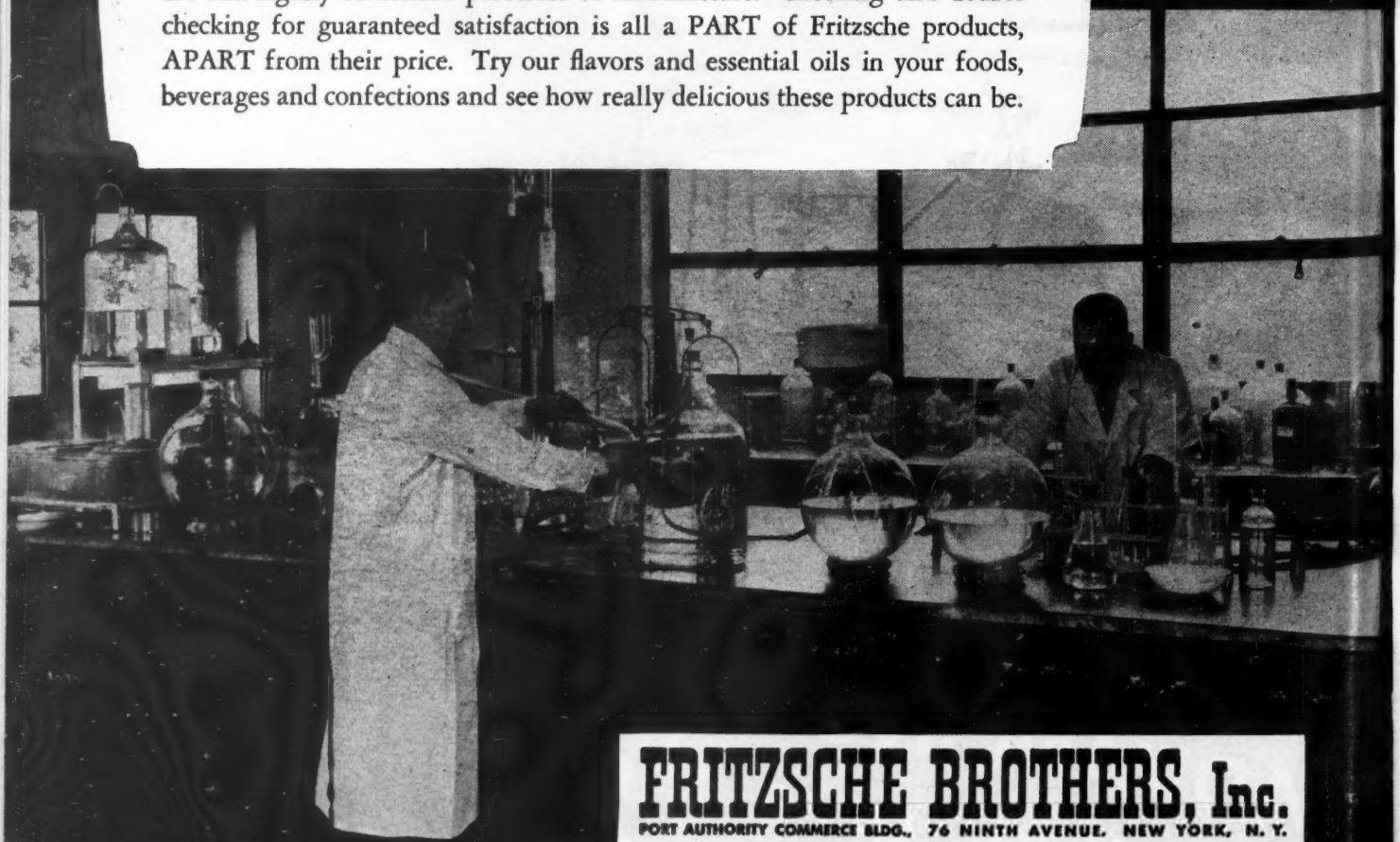
"Oil-Soluble-Vitamin Headquarters"


ANOTHER NATIONAL CONTRIBUTION to our WAR EFFORT
Screaming down at six miles a minute Stukas, mistaking their own tanks in the swirling dust of battle, divebombed Mark IV's.
But our boys won't make that tragic error. For our tanks, going into battle, signal supporting aircraft with a new development of the Chemical Warfare Service—a vivid smoke bomb which unmistakably distinguishes friend from foe. Set off instantly and color-coded, these smoke signals are visible from 10,000 feet.
Thus National Dyes, specially formulated for pyrotechnic use, join the long list of products developed by National Technical Service for arming, clothing and protecting the health and lives of our armed forces.
NATIONAL ANILINE DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET NEW YORK 6, N. Y.
BOSTON PHILADELPHIA GREENSBORO CHATTANOOGA
PROVIDENCE SAN FRANCISCO ATLANTA PORTLAND, ORE.
CHICAGO CHARLOTTE NEW ORLEANS TORONTO
ADVANCING they give the COUNTERSIGN

BACKGROUND VALUES... a PART of the product, APART from the price



CHECK AND DOUBLE CHECK... These laboratories at our Clifton plant—analytical above and manufacturing research below—enlarge and supplement the activities of our efficient, well organized New York laboratories. The two, working independently, but in complete harmony of purpose, serve to insure Fritzsche customers that every item they buy, whether flavoring compound, aromatic chemical or essential oil, will be a product made from carefully selected, doubly checked materials, by modern, economical and rigidly controlled processes of manufacture. Checking and double checking for guaranteed satisfaction is all a PART of Fritzsche products, APART from their price. Try our flavors and essential oils in your foods, beverages and confections and see how really delicious these products can be.



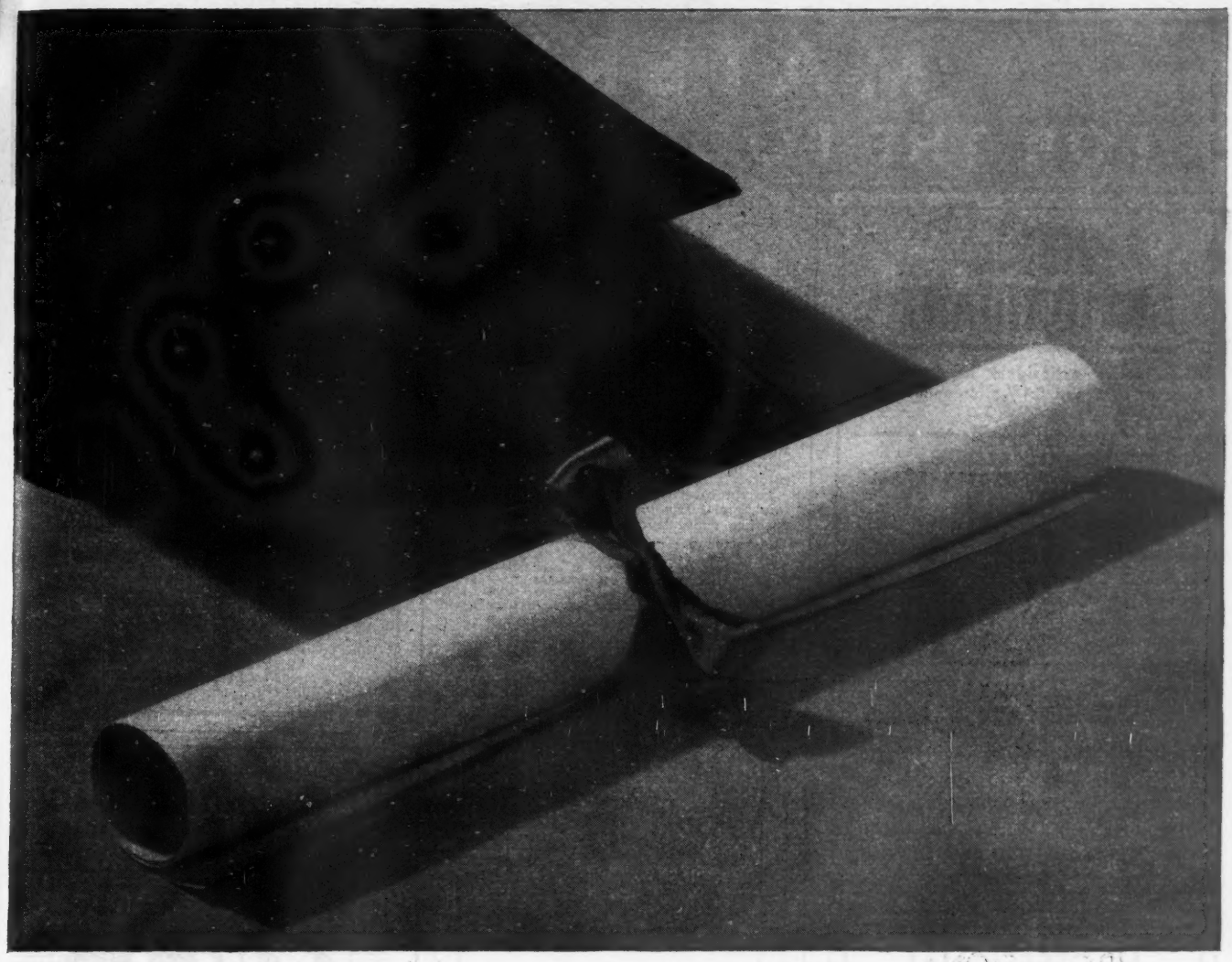
FRITZSCHE BROTHERS, Inc.

PORT AUTHORITY COMMERCE BLDG., 76 NINTH AVENUE, NEW YORK, N. Y.

BRANCH STOCKS

BOSTON CHICAGO LOS ANGELES ST. LOUIS TORONTO, CANADA MEXICO, D. F.

FACTORIES AT CLIFTON, N. J. AND SEILLANS (VAR) FRANCE



Sign-Off?

NOT ON your white ribbon—it's only the *beginning* of education—an invitation to *further* learning.

Americans learn many things from advertising—particularly from educational advertising.

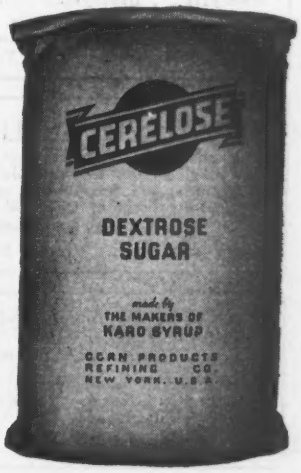
The *educational* advertising of dextrose is just hitting its stride. People are beginning to appreciate new, important facts about this vital food-energy sugar.

So advertising of dextrose is an educational force that advances American industry, and leads toward higher standards of living.

P. S. The present demand for Dextrose far exceeds its supply. Government and industry must *both* be served—but, with us, as with you, the war effort and our boys in service come *first*.

CORN PRODUCTS SALES COMPANY
17 BATTERY PLACE, NEW YORK, N. Y.

The advertising of dextrose, as an educational force, doubly benefits America. Consumers learn how this pure white, crystalline food-energy sugar forestalls fatigue, fortifies energy. Asking for foods "Enriched with Dextrose", they increase the use of American corn, grown by American farmers, refined in American factories, distributed by American companies.



CERELOSE *is* DEXTROSE

TUNE IN

Stage Door Canteen

Every Friday 10:30 to 11:00 P.M., E.W.T., Columbia Network, Coast-to-Coast

MATERIALS
FOR THE FOOD MANUFACTURER

VioBin ANTIOXIDANT

An effective antioxidant in concentrations of 0.05 and 0.1%; for animal and vegetable fats.

DEFATTED, DEHYDRATED
PERFECTLY STABLE

WHEAT GERM
CORN GERM

Richer in B complex than original raw germ. Among richest foods known in B complex, high quality protein, iron and phosphorus.

VioBin WHEAT GERM Oil

Perfectly stable—requires no refrigeration.

VIOBIN CORPORATION
36 Oak St. Monticello, Ill.
VioBin (Canada) Ltd., 637 Craig St., West, Montreal, Quebec

Why does
CARROT OIL
make foods golden yellow?

Because carrot oil contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.

Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil, and because it contributes vitamin A of high stability and desirable golden yellow color.

Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

Also producers of ThiaBee, a stabilized wheat germ products rich in Vitamin B_1.

These vitamin products are of particular interest to all manufacturers of food products.

Inquiries are invited. Literature, prices and samples to firms requesting same on their letter heads.

NUTRITIONAL RESEARCH ASSOCIATES, INC.
201 Broad Street
South Whitley, Indiana

EST. 1866
High Quality
and
UNIFORMITY
In Our Brands of...

Tapioca Flour — Rice Starch
Pearl Tapioca — Potato Starch
Egg Albumen — Rice Flour
Egg Yolk — Potato Flour
Stabilizers — Soya Bean Flour
Corn Starch — Vegetable Gums
Granulated and Flake Tapioca
Pure Food Dextrines

STEIN, HALL & COMPANY, Inc.
285 Madison Avenue, New York
Boston Providence Chicago Rochester
Philadelphia Charlotte Toronto Buffalo
San Francisco Los Angeles

PIONEERS VITINC SINCE 1936 TRADE MARK

BASIC A AND D
VITAMIN MANUFACTURERS

HEADQUARTERS FOR TECHNICAL INFORMATION

VITAMINS, INC.
809 W. 58th ST.
CHICAGO 21, ILL.

NEW YORK OFFICE
120 BROADWAY
NEW YORK 5, N. Y.

WHERE TO BUY
Featuring additional Equipment, Materials and Supplies for the Food Processing Industries

Filtrine
HIGH EFFICIENCY
WATER FILTERS
Insure cleaner water and purer foods. Immediate shipment.
FILTRINE MANUFACTURING CO.
53 Lexington Ave., Brooklyn 5, N. Y.

POWERS TEMPERATURE and HUMIDITY CONTROL
Automatic Control
For Industrial Processes, Heating and Air Conditioning Systems, Hot Water Heaters and Shower Baths. Write for Bulletins.
Offices in 47 Cities
2893 Greenview Ave., Chicago, Ill.
THE POWERS REGULATOR CO.

PROFESSIONAL SERVICES

L. CHARLES MAZZOLA
Consulting Food Technologist
Dehydration—Canning—Preserving
Originator of
"Mazzola Lye Peeling"
Hastings House, Hastings-on-Hudson, New York

SCHWARZ LABORATORIES, INC.
Analysts . . Biologists . . Consultants
Foods, Beverages, Oils, Water and Vitamin Determinations
202 East 44 Street New York 17, N. Y.

FOSTER D. SNELL, INC.
Our chemical, bacteriological, engineering and medical staff with completely equipped laboratories are prepared to render you Every Form of Chemical Service
Ask for copy of Bulletin 3W
302 Washington St. Brooklyn, N. Y.

ARTHUR VAN HEEDEN
Consulting Chemist
Specializing in Development of Manufacturing Formulae and Processes for the Food Industries. Dehydration.
3500 South Ellis Avenue, Chicago

WHERE TO STORE FROZEN FOODS

QUAKER CITY COLD STORAGE CO.
PHILADELPHIA, PA.
3 WAREHOUSES 3
Proper Temperature For Frozen Foods

The Food Industries are their own best customers

Practically every Food Manufacturer depends upon some other branch or branches of the Food Field as a source of his Raw Materials.

Should your products appear on this page?

Whose Market?

THERE is no such thing as a market that favors either buyer or seller exclusively . . . it favors both or none.

When the buying end of business cannot get raw materials, manpower, containers, or whatever is necessary for the production of finished goods, the selling end cannot make shipments to customers on schedule.

It takes both buyers and sellers to make a business, and *teamwork* to make a success of it. So . . . let's not delude ourselves that these difficult times are a paradise for so-called "sellers." We are all confronted with identical problems and we will have to work them out together. *Together,* we can work them out best.

Note Our New Address!

NATIONAL STARCH PRODUCTS
INCORPORATED
270 MADISON AVENUE, NEW YORK 16, N. Y.
CHICAGO — PHILADELPHIA — BOSTON — INDIANAPOLIS — SAN FRANCISCO

FOR A MERRIER CHRISTMAS IN 1944 BUY U. S. WAR BONDS AND STAMPS TO-DAY

IMITATION

SPICE OILS

★ ANISE ★ MACE ★ CASSIA
★ NUTMEG ★ CINNAMON
★ GINGER ★ SAGE
and many others

You can use Felton Imitation Spice Oils wherever natural spice character is desired. Exceptionally faithful replacements for the natural spice oils, uninfluenced by shortages or restrictions!

WRITE FOR TESTING SAMPLES AND QUOTATIONS

FELTON
CHEMICAL COMPANY, Inc.
599 JOHNSON AVENUE, BROOKLYN, N.Y.
Branches in principal cities
MANUFACTURERS OF FLAVORS, ESSENTIAL OILS, AROMATIC CHEMICALS

Florasynth
LABORATORIES, INC.
NEW YORK, N. Y

CHICAGO • DALLAS • DENVER • LOS ANGELES
NEW ORLEANS • SAN FRANCISCO • SEATTLE • MONTREAL
TORONTO • VANCOUVER • WINNIPEG • MEXICO CITY

REMEMBER

This one name for Better Spice Flavors—

SPICEOLATES

You can use Spiceolates to great advantage not only in extending your dwindling supplies of natural spice oils, but also as complete replacements for the dry spices you use in your formulas.

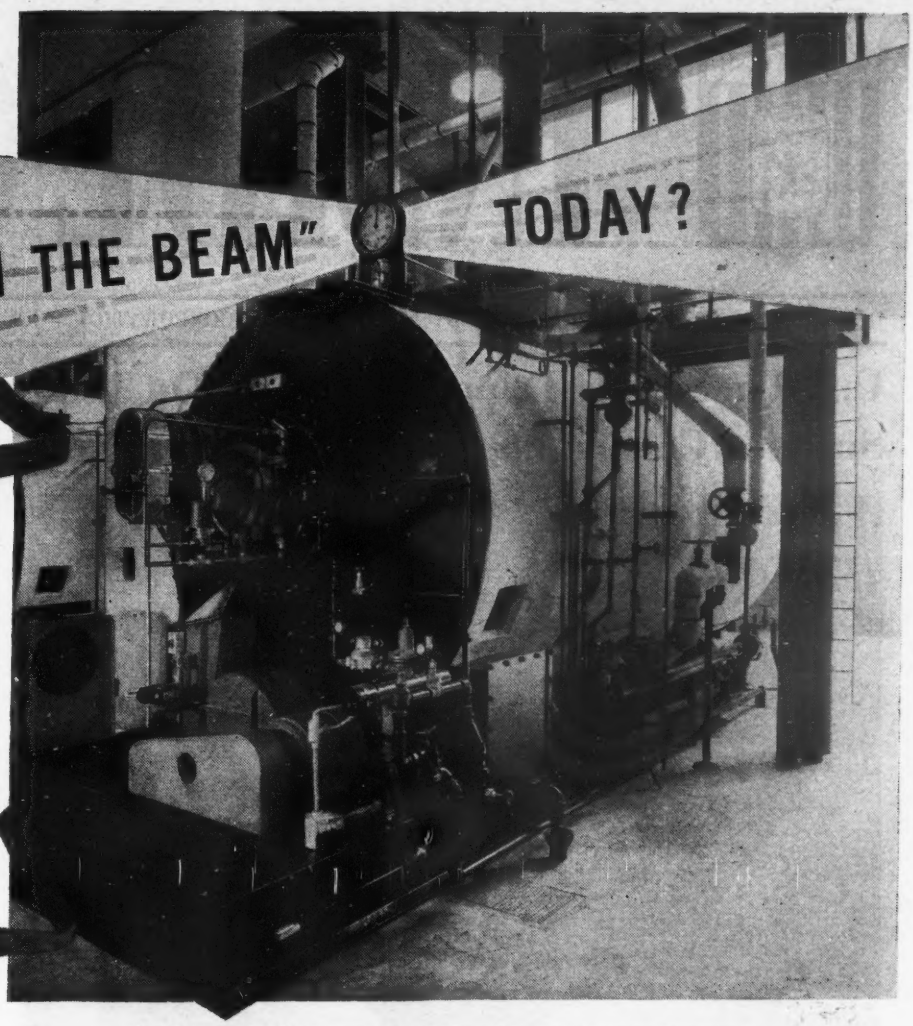
CALL D & O WITHOUT DELAY!

D.O

DODGE & OLCOTT COMPANY
180 VARICK ST., NEW YORK, N.Y.
Boston · Chicago · Philadelphia · St. Louis · Los Angeles
Plant & Labs., Bayonne, N.J.

WAS YOURS "ON THE BEAM" TODAY?

At Top — Low — or Extremely Fluctuating Loads The Cleaver-Brooks Steam Generator Meets Requirements For All Production Needs With Effortless Precision.



One of seven 500 HP Cleaver-Brooks Steam Generators in a prominent war-production plant. Note the extraordinary CLEANLINESS of this boiler-room.

QUICK, effortless response to all steam demands is one of many outstanding advantages of Cleaver-Brooks oil-fired steam generators. They're THRIFTY with fuel — because of the original and exclusive Cleaver-Brooks four-pass, down-draft construction of the boiler with its long fire-travel and specially designed burners.

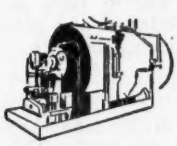
They offer the extremely high fuel-to-steam-ratio efficiency associated generally with "utility" power plants, plus unusually low attendant and maintenance costs. Their compact design calls for only a minimum of installation and operating space. And — vitally important to every food packer or processor — a Cleaver-Brooks steam generator assures not only a kitchen-clean boiler room but CLEANLINESS throughout the plant premises—no smoke—fly-ash—clinkers.

Get complete information now for your post-war and re-employment planning programs on Cleaver-Brooks Steam Generators, 20 to 500 HP, pressures 15 to 200 lbs.

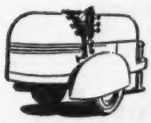
CLEAVER-BROOKS COMPANY
5103 N. 33rd STREET MILWAUKEE 9, WIS.

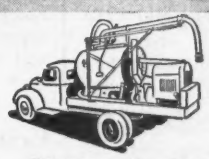
Cleaver-Brooks
STEAM GENERATORS

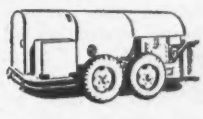
CLEAVER-BROOKS PRODUCTS INCLUDE:


Steam Generators

Food Processing Equipment


Tank Car Heaters


Bituminous Boosters


Special Military Equipment

INSIDE NEWS

DECEMBER PREPARED BY NATIONAL CAN CORPORATION, NEW YORK, N. Y. 1943

U.S. Tin Supply Depends Largely On Texas Smelter Constructed In The Nick Of Time

Young technician uses balance to determine amount of tin in slag after extraction from Bolivian ore. Laboratory control helps insure high metal recovery at Longhorn plant.

News of U. S. tin resources is now being made available through the heavy veil of censorship which shrouds this strategic metal.

Among many stories of unpreparedness before Pearl Harbor, this is a story of foresight and enterprise on the part of both Government and Industry.

Realizing the danger of being cut off from processed metal by seizure of smelters in the Dutch East Indies and bombing of smelters in the British Isles, the U. S. secured Bolivia's entire tin output for a smelter yet to be built. When negotiations were completed, construction of the big smelter in Texas began.

The Billiton Company, experienced in East Indies tin production, built the Longhorn plant on the Texas Gulf Coast, from which tin was delivered by April 5th, 1942.

Behind this achievement is the long-standing realization of the unsatisfactory dependence of U. S. tin on distant foreign sources. At the same time, it was realized that Bolivian ores were of lower grade, would require hard rock mining methods, while East Indian high grade ores were largely alluvial. In 1937, territories now under Japanese control produced 140,000 long tons, Bolivia only 25,000.

The U. S. has always used more tin than any other nation in the world but never smeltered it on a major scale until today. Dutch and British smelters, closer to sources of supply, were more economical. As a result, two smelters constructed during World War I were abandoned because they did not pay.

Today, the Government smelter in Texas is producing 50,000 long tons a year. 498

Typhus Controls

American medical discoveries which promise to wipe out typhus fever among American forces all over the world have been announced. Much is preventive medicine. Since body lice are carriers of typhus, American discovery of a chemical which will kill cooties and their eggs is hailed as a miraculous discovery. 499

Ecuadorian Hemp

A new source of fibre has been discovered in the Pasaje area of Ecuador and 500 plants of the African bowstring hemp type are under cultivation. It is reported to be "as good as, if not better than, sisal hemp". With manila hemp cut off by the war, the Americas are cooperating in a program to increase fibre production. 500

Polyvinyl Compounds

Polyvinyl compounds in a special form are claimed to make an excellent undercoat when it is desired or necessary to coat rubber surfaces with a lacquer of oil varnish, according to a recent British patent. Rubber balls, for example, can be so coated to produce a very adherent finish. 501

Vegetable Rash

Some vegetable dehydrators have reported that their employes working at trimming tables and the like have been troubled with a rash or swelling of the hands—a sort of vegetable poisoning. Since prevention is more important than remedy, some plants use a special chemical preparation which is in most cases a preventive as well as remedy, to supplement wearing of rubber gloves, keeping hands as dry as possible and washing with disinfectant soap. 502

Effective Finishes

Hammered metal finishes are simulated by coatings described in two recent patents. The first involves the application of a coating containing metallic powders and spraying with large droplets of solvent. The second advocates the production of hammered effects in one coating by the use of a small amount of raw rubber. 503

Cow to the Rescue

Vinegar from milk? An enterprising Western outfit has uncovered a means of processing a milk residual product into a high quality white still vinegar. Thus the cow helps again to relieve wartime shortages, if you're interested. 504

Industrial Thermometer

A one-piece industrial thermometer designed to save critical materials in war time has been introduced. It is said to be dustproof, rattleproof and practically fumeproof—with a wider than usual angle of vision for the mercury column. 505

Fish Positioner

To reduce the amount of manual labor involved in packing fish in cans, an inventor has recently perfected and patented a mechanism for positioning the pack. 506

Milk Dryer

A new process for drying milk has been developed and patented recently. The system permits aeration of the milk while drying. 507

NATIONAL CAN

PLANTS: NEW YORK · BOSTON · BALTIMORE · CHICAGO · HAMILTON, OHIO · FORT WAYNE, INDIANA

Antiseptic Foot Spray

In place of the usual foot baths the government is reported to be experimenting with the use of atomizers which disperse an antiseptic spray for the prevention of epidemics of athletes' foot in Army camps, shower rooms, bathing pools, etc. The efficacy of foot baths has been questioned by many authorities in the past who report that in many cases they serve, after the antiseptic liquids have lost their potency, merely as sources of infection. The units being tested consist of sets of nine atomizers which throw an antiseptic spray over the feet. An order for 1,000 of the units is reported to have been placed on the west coast. 508

Fungicides For Post-War Control

A serious post-war problem will be the development of a control program to prevent entry into the country along with returning members of the Armed Forces of organisms that may cause disease or damage American crops or plants. Inasmuch as the potential danger lies principally with sporulating organisms, such as fungi and molds, fungicides will inevitably be of primary importance in formulating the control program. 509

Keeping Quality Bettered

To improve the keeping quality of the juice extracted from fruits, a new method of cleansing the surface of the fruit prior to extracting the juice has been developed. Information on a simple procedure is available. 510

Second Bactericide From Bread Mold

The common forms of green mold on bread and cheese—penicillium notatum—have given the world penicillin, heralded as the greatest yet known germ killer. Scarcely has the word of a few examples of its remarkable potency come into the thinking of the man in the street before scientists have announced a second anti-bacterial substance coming from this same bread-cheese mold. This newest bactericide is able to act against a number of organisms which are not especially sensitive to penicillin. If you've missed details of its name, background and reactions, they're yours for the asking. 511

Britain Permits Paint For Private Property

Britain has permitted the manufacture of paint in four colors for outside use on private property. Permission to manufacture the "utility" paint has been extended to selected firms in given areas in containers containing one pint and one quart. The specifications for the paint call for a special combination of materials. The intention is that the paint be used for exterior purposes only, and repainting done only where necessary. The manufacture of household paints heretofore had been banned in Britain, to save critical materials. 512

Technical Topics

VITAMINED CHOCOLATE — Foreign experiments show that vitamin-fortified chocolate is a practical (and pleasant) way of providing vitamins, having a natural tendency towards preservation of potency of the vitamins. 513

BIODYNES—The newest application of life forces, this time through the cosmetic field, is announced. Incorporated in a night cream and a day lotion, they are reported by a leading research institution to step up skin respiration which usually slows as age increases. 514

MULTI-USE GRASS—A new kind of grass found in a South American country is reported rich in a variety of uses—ranging from insect repellent to clearer of ticks from cattle with brief pasturing. 515

COSMETIC OILS—Oil from a nut tree, anti-oxidated by gum from a tropical tree, has been suggested for cosmetics because of its property of absorbing and holding odors. 516

"DEMEROL"—A synthetic substitute for morphine, formula for which is available, will soon be ready for the public. 517

WATER STERILIZER—Foreign experiments reveal iodine, in a formula solution which is available, is more effective than chlorine in sterilizing water. 518

WOOD PRESERVATIVE—A process which forces zinc chloride into wood under designated means is said to preserve the life of the wood three to ten times. 519

LACTIC ACID—Conversion of lactic acid to a substance useful as adhesives, impregnating and coating materials has been worked out by a Department of Agriculture. 520

QUEBRACHO EXTRACT — Recently suggested as a flotation aid in the froth purification of barytes minerals. Barytes floated with customary froth promoters, such as fatty acid compounds, often presents a difficulty in obtaining a good concentration, paticularly when the ore contains gangue minerals of the chlorite group. 521

AMINO-HYDROXYPHENYL ARSINE —Introduced by a foreign pharmaceutical company for the treatment of spirochaetal infections similar to syphilis. It is offered in ampoules suitably diluted to facilitate the preparations of isotonic solutions for intravenous injection. 522

SODIUM FLUORIDE—A high quality, silica-free purity is declared to be possible from hydrofluosilicic acid in a recent British patent. 523

MONO SODIUM GLUTAMATE—A desirable replacement or extender for this article (used extensively for flavoring soups, gravies, stews and other similar products, and which is now practically unobtainable for civilian use) has recently become available. A bone-dry powder, it is said to be specially desirable, from flavor and nutritional standpoint, in production of bouillons. 524

METHOXYTRIGLYCOL ACETATE—Offered in research quantities, with the suggestion that its low volatility, non hygroscopicity, and excellent solvent powers for cellulose esters and synthetic resins indicate a potential usefulness in protective coatings, printing inks, and as an anti-dusting agent for fine powders. 525

HYDROFLUORIC ACID — Production by a continuous process from fluorspar and sulphuric acid is described in a recent British patent. Instead of mixing ground fluorspar and sulphuric acid into a paste-like mixture, the patent advises a procedure which is claimed to produce gaseous fluorine compounds more uniformly and at a lower temperature. 526

SODIUM SILICOFLUORIDE — Under investigation by a foreign leather industry as a preservative for hides against attack by hide beetles. 527

"STOREHOUSE" FISH—A prolific fish, known under many names from Maine to South Carolina, is a storehouse of all the elements necessary for a healthful diet, it is claimed. The fish's name and elements are yours, if you're interested. 528

PLANES TO POWDER—A plant engaged in an airplane construction process contributes to new cosmetic cases, it is reported. 529

Every effort will be made to furnish additional information on these articles. Where such information is not obtainable, we will refer inquiries to the original source of the article. Write to National Can Corporation, 110 East 42nd Street, New York City. Please mention the number at end of article—also name of the magazine you saw it in.

NATIONAL CAN CORPORATION

Manufacturers of

SANITARY PACKERS CANS · PLAIN AND LITHOGRAPHED CANS FOR FOODS, DRUGS, OILS, PAINTS, VARNISHES · STEEL DRUMS AND PAILS

Deliveries Subject to Priority Ratings

(*Advertisement*)

For the
FOODS *of* VICTORY

Finer grinding, homogenization, emulsification *with*

PREMIER

PREMIER COLLOID MILLS

which process liquids, solids or pastes—dispersing the elements of the food completely—reducing them to micron sizes unobtainable with other equipment. Mills available with capacities to 1,200 gallons or 10,000 pounds per hour depending on food to be processed. Submit *your* product to our laboratories for test.

See Our Exhibit at 19th Exposition of Chemical Industries.

Send

for Particle Size Table — a breakdown of particle sizes and their micron equivalents . . . practical and useful to processors. Available on request. Send for folder F10.

PREMIER MILL CORPORATION
218 GENESEE STREET • GENEVA, NEW YORK
General Sales Office: 110 East 42 St., New York 17, N. Y.

You can depend on DAMROW Tank Engineering

to profitably solve

YOUR Special Container Problems.

DAMROW Custom-Designed tanks, vats, containers of every type, size and shape are on duty NOW in practically every phase of the Food Industry. They're serving many standard and special needs in food processing, storage, mixing, cooking, blanching, handling . . . Serving those needs EXACTLY because of Damrow's long experience in designing the "right tank for the job."

When YOUR processing or production calls for this kind of "Know How" in Container engineering, let us show you how the knowledge, experience and the unusual fabricating facilities at Damrow can work to your benefit. Send a sketch of the tank or vat you have in mind, or outline your problem briefly in a letter. We promise a profitable solution.

DAMROW
"Custom-Designed"

PRODUCTS INCLUDE—

Oval-Round-Rectangular Tanks —Any size—any shape
Stainless Steel Tanks
Galvanized Steel, Copper Tinned Tanks
Agitator Storage Tanks
Mixing Tanks
Truck Tanks
Vapor-Film Heating Tanks
Stainless Steel Filter Tanks
Kettles, Containers of all sizes and shapes
Jacketed Tanks for indirect Heating & Cooling

Damrow-Built Storage Tanks of Stainless Steel with Agitator.

DAMROW BROTHERS COMPANY
190 WESTERN AVENUE FOND DU LAC, WIS.

CUSTOM—DESIGNERS of Tanks, Containers for all INDUSTRY

war-time packaging problems?

Sylvania Cellophane*

offers you technical service and cooperative assistance in:

selection of proper materials
package designing
fabricating
converting
sealing
testing
methods and machinery
for military and civilian packaging requirements

Sylvania cellophane is serving many war uses

SYLVANIA
CELLOPHANE

SYLVANIA INDUSTRIAL CORPORATION

General Sales Office: **122 East 42nd Street, New York 17, N. Y.**

Works and Principal Office: **Fredericksburg, Virginia**

*Trade Mark Reg. U.S. Pat. Off.

To the 17 Food Plants

having a combined

FIRE LOSS of $2,420,032.00*

In the 3rd quarter of 1943

Your misfortune of having fire destroy production facilities, naturally, was a tragic loss. Today, no doubt you have solved the problems of replacing your destroyed equipment. More important, however, the experience of fire has probably emphasized the all-important fact that fire can and often does destroy expertly-designed, well-managed food plants.

Your experience in having fire may, therefore, give you reason for wanting to know about a fire extinguishing system that will provide continuous protection for critical fire hazards in your food processing. It is a system that combines the advantages of automatic and manual operation, that extinguishes amazingly large fires in a few seconds, and that leaves *no damage or residue* from the extinguishing medium.

Record in War Production

Unless you have had unusual opportunities to check into the actual fire experience throughout war industries you may find that such fire extinguishing performance is new to your company. The fact is, however, that this kind of performance, in coping with the hazard of fire, by use of an engineered system, is serving daily to prevent many of America's war industries from disastrous losses by fire.

As a company alert to the advantage of all possible use of better technology, you may, therefore, be definitely interested in having full information on Cardox Fire Extinguishing Systems. In the following paragraph you will find a brief description that will help you visualize how a Cardox System would perform in your plant.

How Cardox Systems Perform

Installed to protect hazardous operations of food processing, a Cardox System can provide means of detecting fire in such places as storage areas, processes wherein flammable liquids are used or handled, electrical equipment or any of a wide variety of hazards that may—either through human failure or accidental ignition—start a fire that could easily destroy your plant.

When fire is detected automatically an alarm sounds, giving personnel notice to leave the fire zone. Time is allowed for complete evacuation of personnel. A timed, mass discharge of cold Cardox CO_2 is released into the fire zone to cool out the entire fire. So rapidly is the Cardox CO_2 discharged into the fire that actual burning time can be cut down to a very few seconds. This means, of course, that plant, property, production and lives are saved before fire can get "out of control."

Then after the fire is out—and its cause is corrected by your maintenance staff—your Cardox System is reset and your production is resumed. You have no clean-up, residue, or damage by the extinguishing medium. Carbon dioxide is a non-damaging, non-contaminating, inert gas.

Engineered Application of CO_2

Extinguishment of this kind is possible with a Cardox System because the carbon dioxide is maintained at a standard storage temperature of 0°F. Its extinguishing performance will be uniform regardless of weather condition or operating temperature in your plant.

This advantage of uniform extinguishing performance makes it possible to engineer large systems covering one or a number of hazards as may be required by the conditions in your plant. It means, also, that convenient hosereels can be included in the system for fire that would call for local direct application of Cardox CO_2. For example, loading or unloading volatile and flammable liquids.

For An Inert Atmosphere

Another manner in which enhanced value and performance is available in the Cardox System is the ease with which you can use the carbon dioxide gas as it is stored in a large centrally located Cardox storage unit for processing operations which are better or more safely conducted in an inert atmosphere. All that is necessary is to have in your Cardox System an inerting line from your Cardox Storage Unit to the process for which an inert atmosphere is needed.

Write for Bulletin 12143

You can realize how these advantages are readily possible when you remember that Cardox Systems are individually egineered for the specific hazards they are installed to protect. If you see the advantage in protecting your plant, your personnel, your production—and your *markets*—against the ravages of fire loss, you will certainly want to have a copy of Bulletin 12143.

**Figures compiled from N. F. P. A. reports*

CARDOX CORPORATION
BELL BUILDING • CHICAGO 1, ILL.

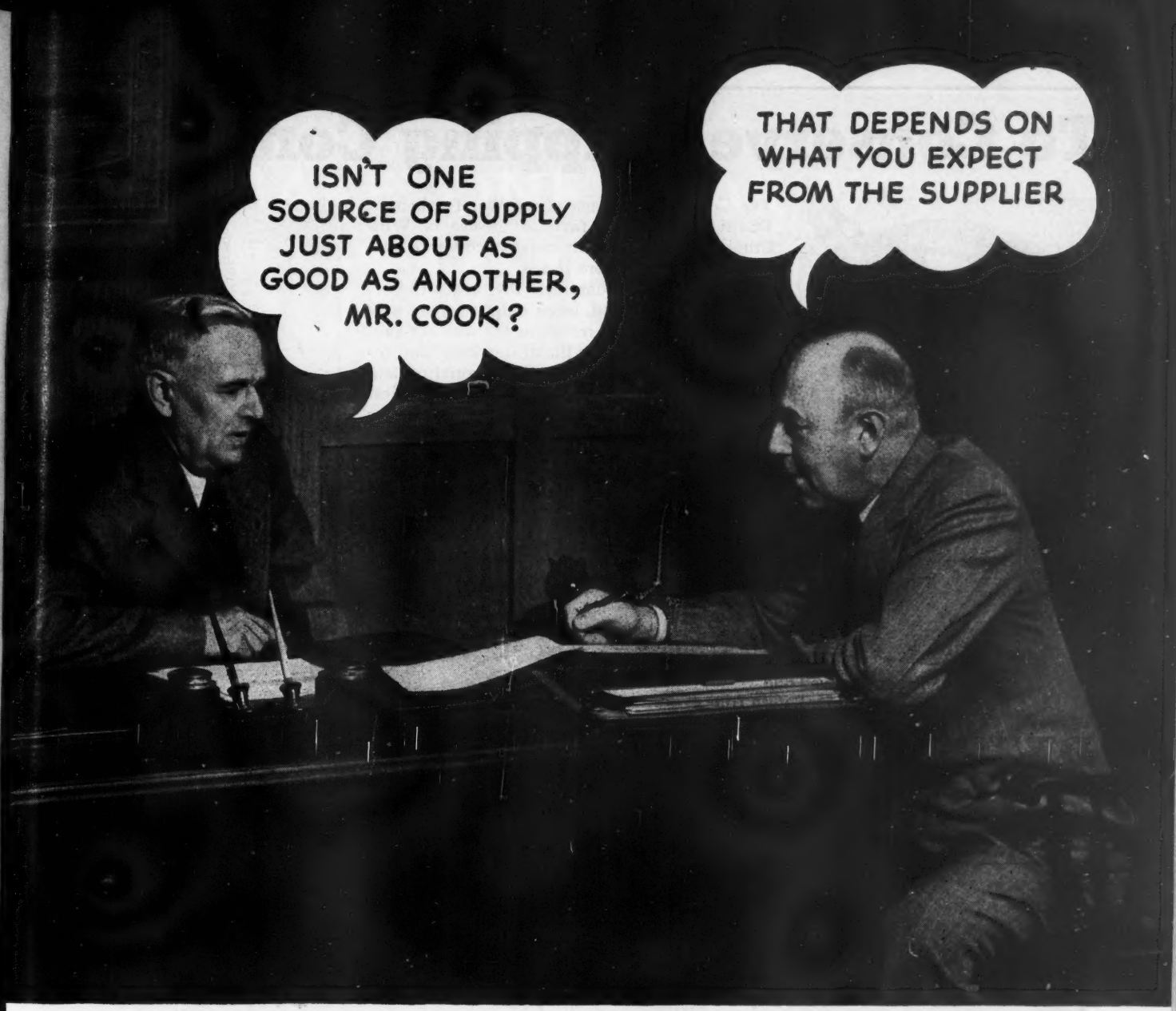
District Offices in **New York • Washington Detroit • Cleveland • Atlanta • Pittsburgh San Francisco • Los Angeles • Seattle**

Cardox engineers are working, in the first place, to prevent fire loss by war industries and the Armed Services. In the second place, Cardox engineers are giving all possible assistance to industries that are including in their post-war plans the objective of America at peace without loss of property and life by fire. Whatever your status, you will be completely welcome to Bulletin 12143. Write for it on your company letterhead.

MASS DISCHARGE OF CO_2 · ENHANCED COOLING EFFECT · CENTRAL STORAGE UNIT · AMPLE CO_2 RESERVE · ENGINEERED SYSTEMS · MANUAL OR AUTOMATIC CONTROL

CARDOX

NON-DAMAGING FIRE EXTINGUISHING SYSTEMS



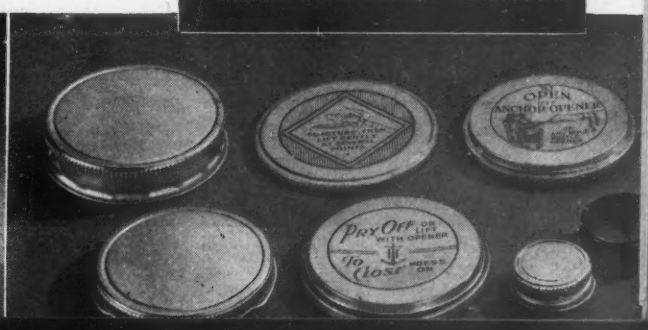
All of us in the glass container and closure industry do our best to make lighter, stronger, less expensive containers, and dependable, more efficient lower cost closures. Each company, to promote these improvements, spends in research and development as much as it can afford. And the efforts of all are, of course, commendable. But some companies succeed beyond others in improving products, lowering prices or bettering service. This may be because of extensive experience, large facilities, exceptional financial ability, or a strong insistence upon a higher manufacturing standard. When, as with Anchor Hocking, all these attributes are combined, that company is, obviously, better qualified as a highly desirable source of supply.

M. L. COOK, one of Anchor Hocking's ablest and most popular men, has been a member of the Anchor Hocking family for 17 years.

ANCHOR HOCKING

GLASS & CAPS

ANCHOR HOCKING GLASS CORPORATION — LANCASTER, OHIO



To Conserve Shipping Containers

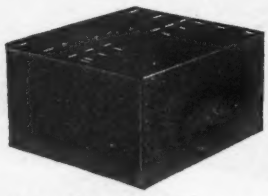
WIRE STITCH REMOVER
Price $1.60 Postpaid

The Containers Branch of the War Production Board has ruled in favor of re-use of Wire Stitched Shipping Containers, to conserve corrugated and solid fibre board.

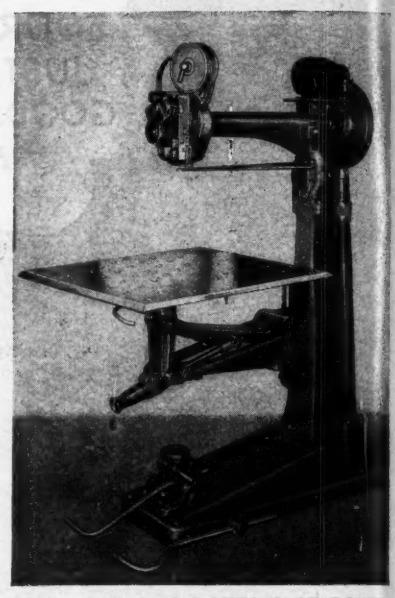
Regular slotted containers that are both bottom and top stitched, when emptied, may now be knocked down by removing the wire stitches, flattening the boxes as illustrated here, and returning them in bundles to the original packer.

This wire stitch remover is a handy, practical tool for quickly removing the wire stitches without breaking or tearing the board. It will materially reduce the time and cost of preparing wire stitched containers for their return trip for re-use. *Send orders to New York Office.*

Box with Stitches Removed and Flattened for Return Trip



Box Stitched Top and Bottom



BLISS TOP and BOTTOM STITCHER
For assembling cases, the blade anvil is lowered, table is swung to one side, and post placed in position for bottom stitching. For top stitching, the post is removed and blade anvil and table swung into position. Change is made in less than one minute.

DEXTER FOLDER COMPANY

330 West 42nd Street, New York 18, N. Y.

CHICAGO, ILL. • PHILADELPHIA, PA. • CINCINNATI, OHIO

Something New in Steam Generators

THE O&S *Powermaster* UNIT

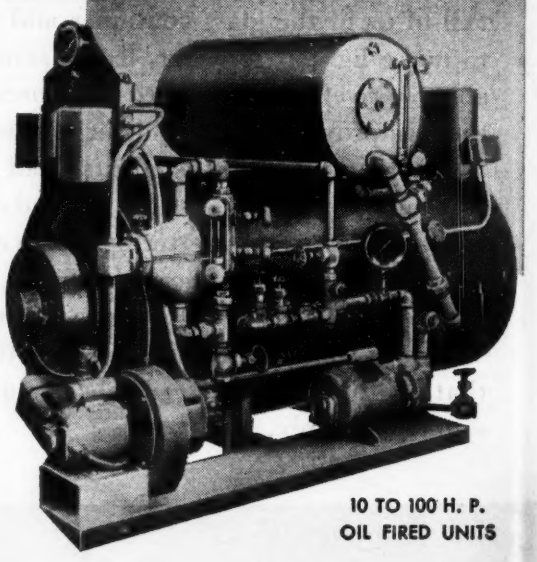
FOR THE FOOD INDUSTRY!

Designed for fast, efficient steam production, the new fully-automatic "Powermaster" is a complete, "packaged" unit. Compact. Lightweight. Easy to install. Easy to clean. And exceptionally speedy — developing 100 lbs. pressure from 60° water in 18 minutes or less!

Backed by more than a half-century of engineering skill and craftsmanship, the new "Powermaster" offers a new "high" in safety, cleanliness and low-cost fuel consumption. Such advantages—which resulted in its use by the Army, Navy and Pan American Airways — can be gained by plants with an AA-2 priority, or better. But in any case, investigate *now* its wide possibilities in your plant.

Get Powermaster Bulletin No. 1213 . . .

It gives you complete information on this new O & S Steam Generating Unit. Your copy will be promptly mailed, without obligation. Write now to ORR & SEMBOWER, INC., 932 MORGANTOWN ROAD, READING, PA.



10 TO 100 H. P. OIL FIRED UNITS

ORR & SEMBOWER INC. READING • PENNSYLVANIA — O&S — Builders of Better Boilers Since 1885

MAKE ONE BEARING OUTLIVE TWO!

One plant that regularly had two or three bearing failures a month writes us, "We have had only one bearing failure in five years since using LUBRIPLATE"... another writes, "Pulled our ball bearing temperatures down from 170° to 130°F"... still another, "If LUBRIPLATE cost $1.50 a pound we could still afford to use it."

BALL BEARING LUBRIPLATE

Over a period of years this outstanding grease type lubricant has reflected superior performance on the general run of ball and roller bearings operating under normal conditions at speeds up to 5,000 R. P. M. and temperatures from zero to 300 degrees F.

Long time users of BALL BEARING LUBRIPLATE everywhere attest to its superiority in providing cool and quiet operation — protection against corrosion, and of major importance, substantial reduction in bearing replacement costs.

Write today for your copy of Bulletin No. 1-43 containing valuable data on the lubrication and care of anti-friction bearings.

7 FACTS ABOUT LUBRIPLATE

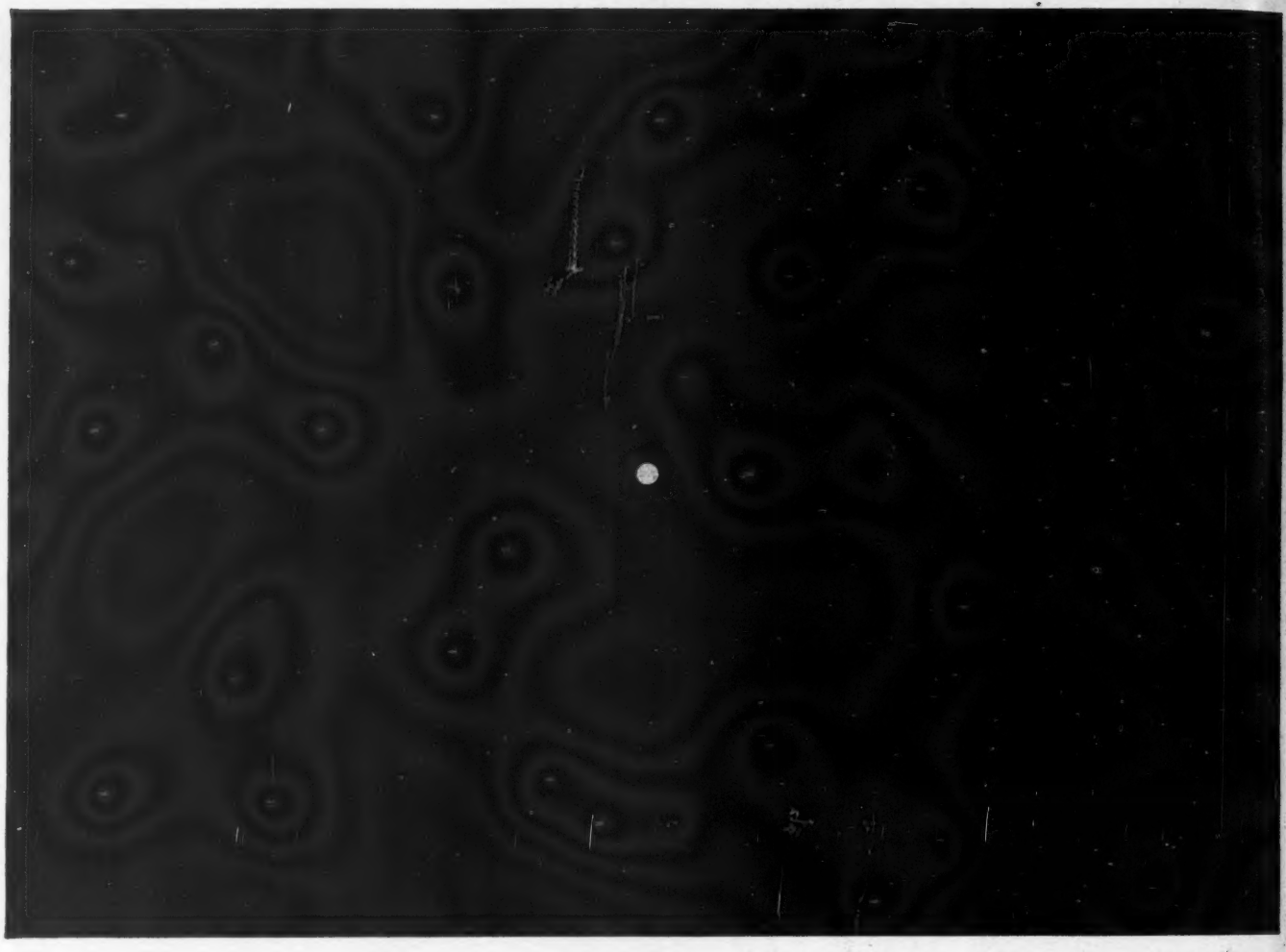
1. *LUBRIPLATE produces an ultra-smooth, wear-resisting bearing surface.* 2. *LUBRIPLATE reduces friction, thus lowering maintenance and power costs.* 3. *LUBRIPLATE resists rust, corrosion and pitting.* 4. *Most LUBRIPLATE products are white. LUBRIPLATE assures clean lubrication.* 5. *LUBRIPLATE outlasts ordinary lubricants many times.* 6. *LUBRIPLATE is economical—a little goes a long way.* 7. *LUBRIPLATE is available in fluid and grease types for every need.*

LUBRIPLATE DIVISION
FISKE BROTHERS REFINING COMPANY
Newark, N. J. **SINCE 1870** Toledo, Ohio
DEALERS FROM COAST TO COAST

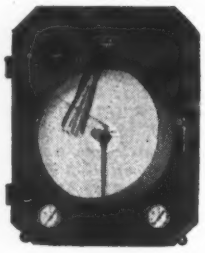
LUBRIPLATE

"Its the Film"

THE MODERN LUBRICANT *that Arrests Progressive wear*



Hey, look! Daylight!



REMEMBER when Tom Sawyer, lost in the cave, finally saw daylight and Becky Thatcher refused to believe it?

We hope you won't feel like Becky when, after so many months of saying "No," we tell you we are actually seeing daylight on orders for Taylor Instruments for the canning industry.

It's true we're still paying the "penalty of leadership" for knowing how to make accurate control instruments for top-priority industries like synthetic rubber, explosives, and high octane gasoline. But we have built up our production facilities to the point where your priorities now permit reasonable delivery schedules. So you won't have to wait much longer to have your blanchers, lye peelers, continuous heaters, retorts, and dehydrators "Taylor-equipped as usual." And that goes not only for old orders but for *new orders placed right now.* May we hear from you?

Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Instruments for indicating, recording, and controlling temperature, pressure, humidity, flow, and liquid level.*

ARMY E NAVY

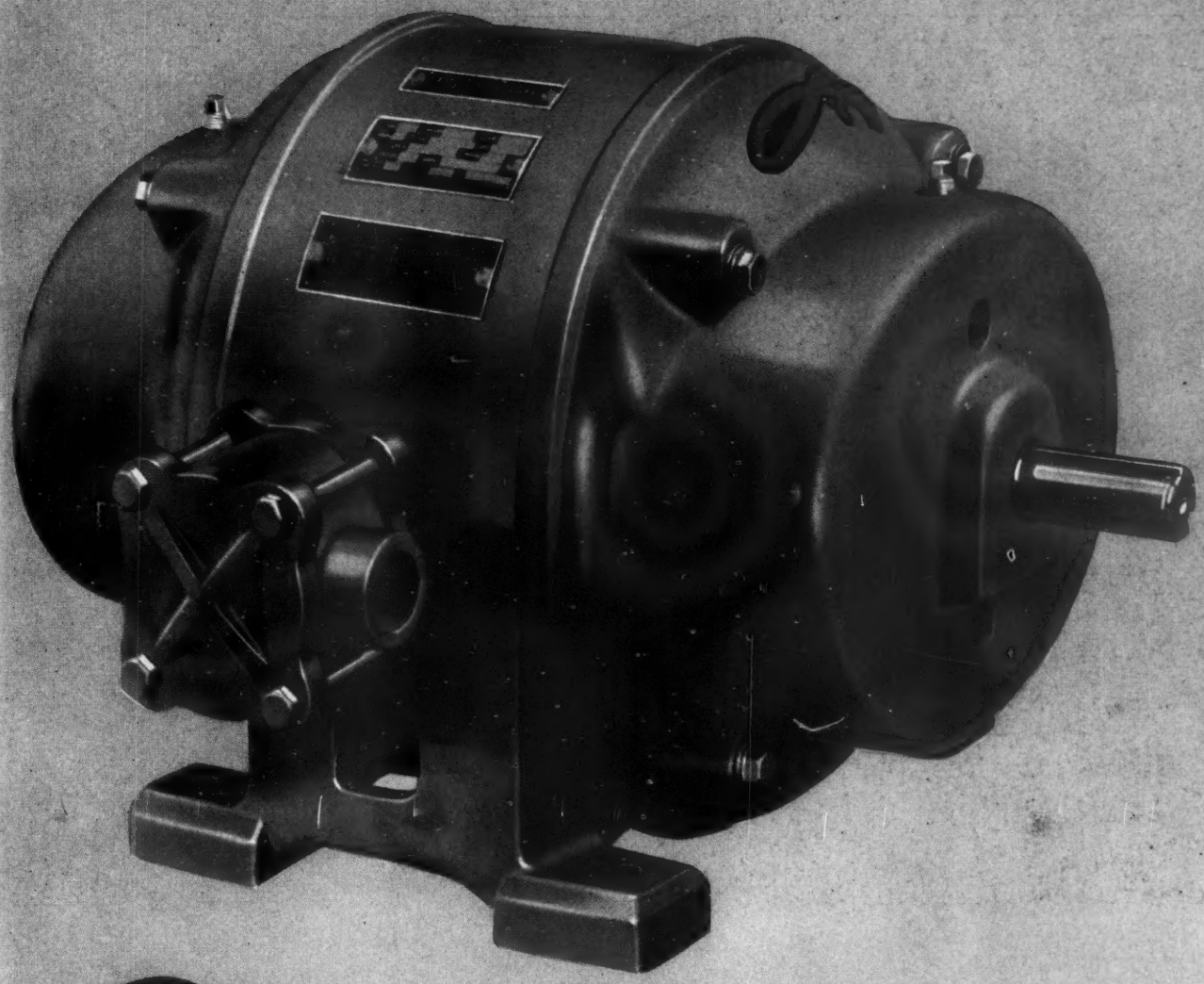
Taylor Instruments

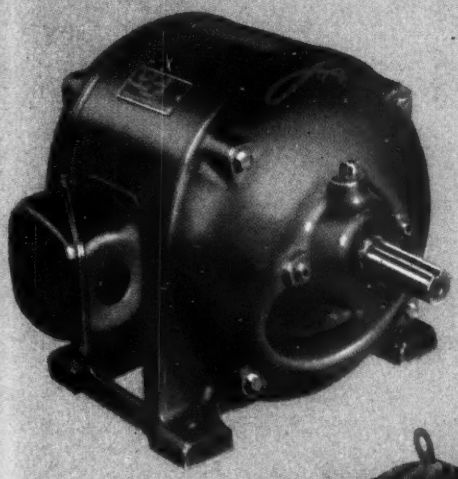
MEAN

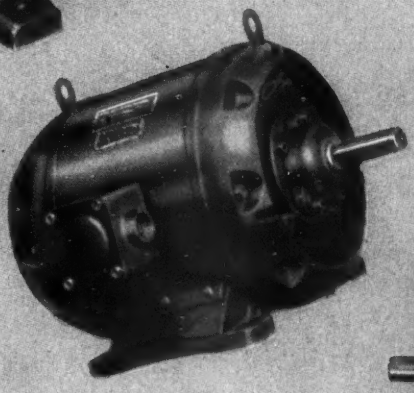
ACCURACY FIRST

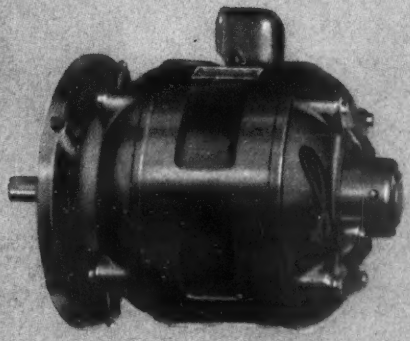
IN HOME AND INDUSTRY

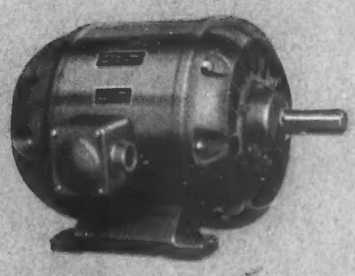
★ KEEP ON BUYING U. S. WAR BONDS AND STAMPS ★











There is a size and type **LOUIS ALLIS** *electric motor for every industrial requirement.*

THE LOUIS ALLIS CO., MILWAUKEE 7, WIS.

Speaking of Electric Motors—

The day of trying to use a standard motor for a special job is about over.

Machinery designers, and production managers have learned that it is much more efficient and economical to obtain a motor with exactly the electrical and mechanical characteristics required to perform a specific job than it is to try to doctor up a standard "shelf" motor to do the job.

Speed and horsepower are no longer the major measuring stick of motor requirements — they are merely incidental to the many other characteristics available in electric motors today.

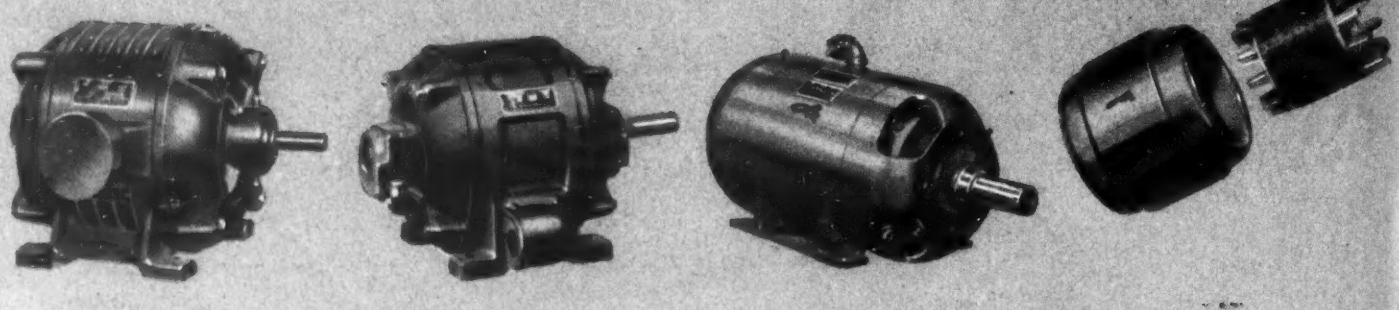
For over forty years we have been developing special motors for special jobs — our engineering department has a wealth of experience along this line —

Right now special Louis Allis motors are serving a major important role in helping your boy and mine win this war — to help bring him back home — safely — and as quickly as possible.

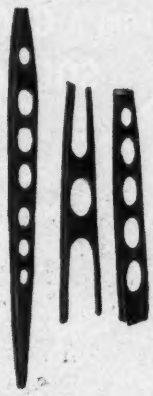
As soon as Uncle Sam does not so urgently need all of our facilities — your electric motor problems and requirements will receive our most prompt and careful attention in every way.

But right now — let's WIN this war!

THE LOUIS ALLIS CO., MILWAUKEE 7, WIS.



TURRET GUNNER'S SEAT



WING-TIP RIBS

Made with

PAPER

STEP ASSEMBLY

X

A wing-tip rib or an ammunition box may seem to have little bearing on your urgent need for protective packaging papers for food at home and abroad.

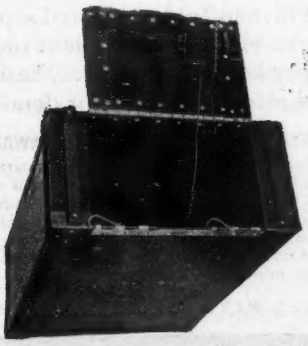
X

But Riegel-X, our new group of impregnated base papers for plastic laminates, is only one of the reasons why we cannot serve all our customers, with all they want, all the time. Paper is being used to replace many other materials in vitally needed products —and our mills and laboratories are under a heavy strain for we are one of the largest manufacturers of special industrial and protective papers.

FLOOR PIECE

X

We are doing our best to serve you within the necessary limitations imposed upon us. Where we cannot supply you adequately, we will gladly help you by recommending substitutes or other sources of supply. Riegel Paper Corporation, 342 Madison Avenue, New York 17, N. Y.



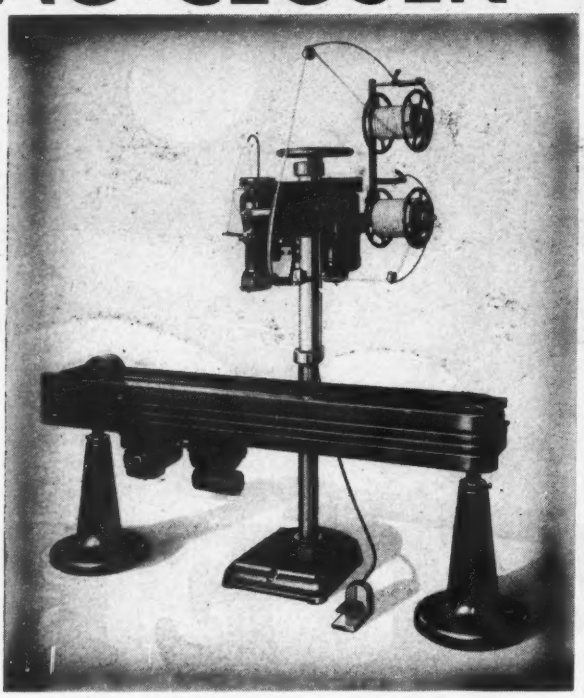
AMMUNITION BOX

Photographs courtesy of McDonnell Aircraft Corp.

RIEGEL-X

A group of plain and impregnated base papers for both fluid and direct pressure plastic laminates.

A New BAG CLOSER



with Unlimited APPLICATION POSSIBILTIES

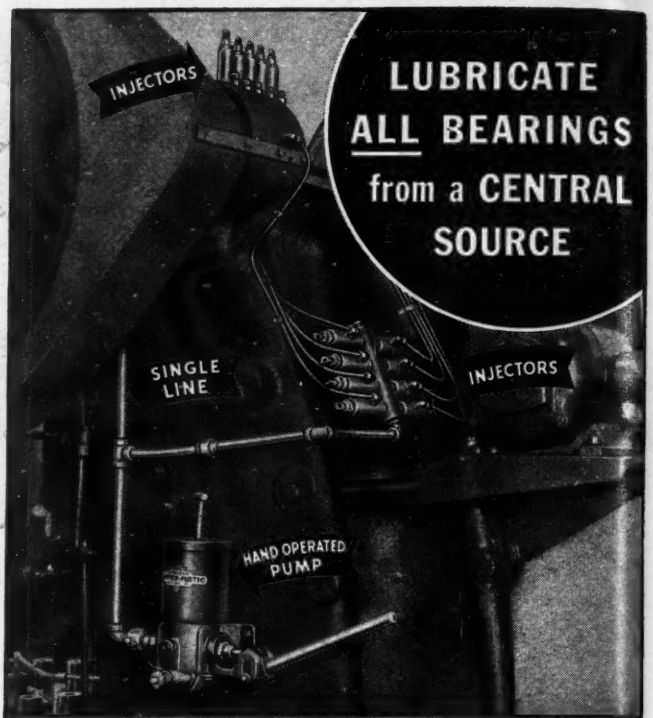
Designated as *Style 20100 P,* this versatile new column type machine will accommodate *all* styles of Union Special sewing heads and can be used with any conveyor, making possible combinations for providing sewed closures for any size paper or fabric bag. The head is adjustable vertically on the column by means of a hand screw. Sewing heads are available for producing the chain stitch or Union Special double locked stitch; for paper bags a plain sewed closure or bound over tape closure can be secured.

Unit shown includes the new Union Special *Style 20100 PB* power conveyor and a *60000 C* sewing head. For full details on this modern, high speed bag closer, write today.

UNION SPECIAL MACHINE CO.
450 N. Franklin St. • Chicago 10, Ill.

Union Special

Bag Closing Machines



Avoid Bearing Failures... Maintain Production for Victory!

★

Equip your machinery with

LINCOLN

CENTRO-MATIC

LUBRICATING EQUIPMENT

The Lincoln method of lubrication provides a simple, practical means of delivering lubricant to all bearings of a machine, or group of machines, from a central source—without stopping machines.

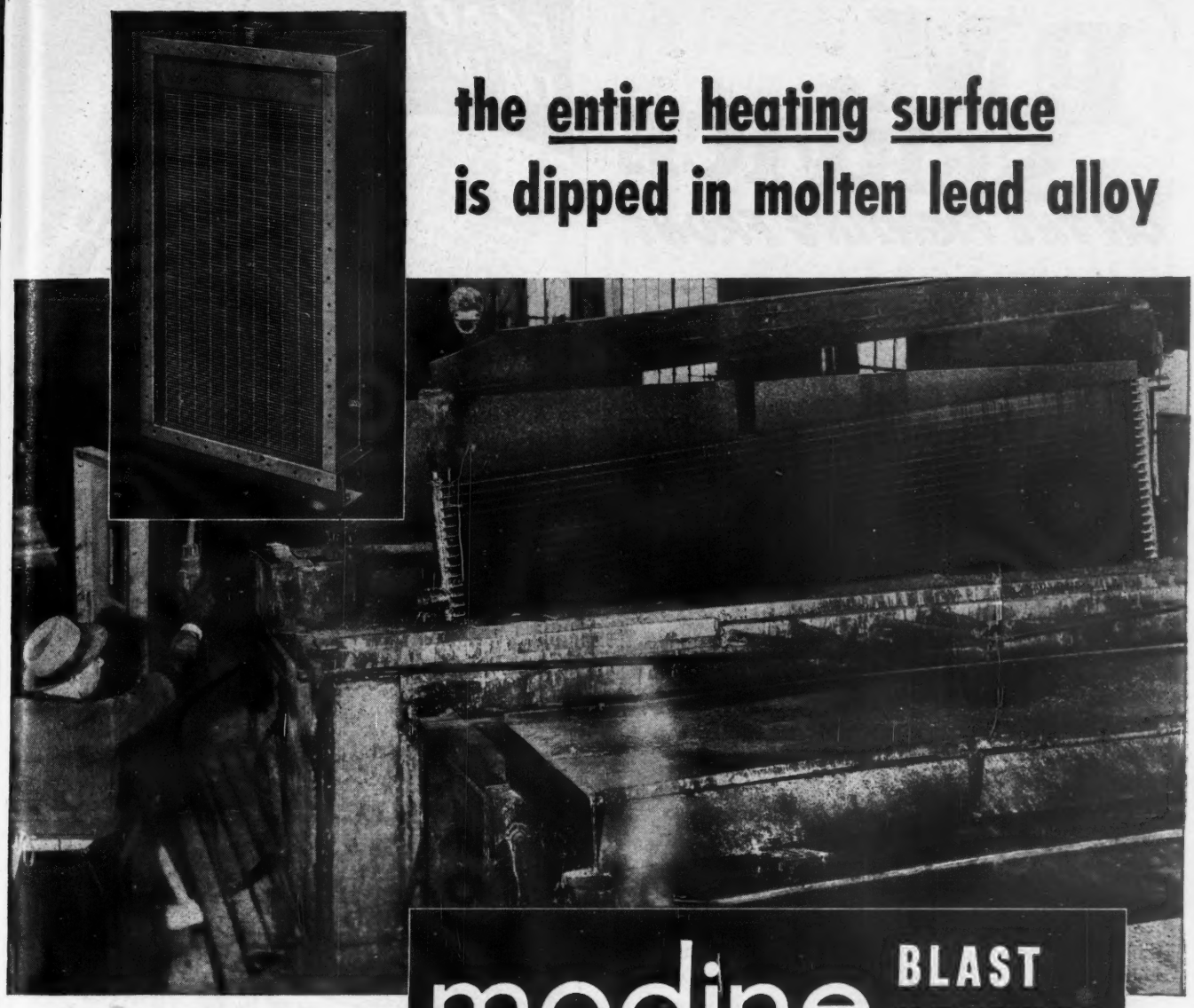
A Centro-Matic System consists of a number of Centro-Matic Injectors—one for each bearing—and a power operated or a hand operated Centro-Matic Pump. A power operated system can be either time clock control or push button control . . . The injectors can be grouped in manifold or located separately at each bearing. In either arrangement only a single lubricant supply line is required . . . Easily installed on new or old machines. Write for details.

ARMY E NAVY

The ARMY-NAVY PRODUCTION AWARD for high achievement in the production of war equipment, conferred upon the Lincoln Engineering Company has had a star added. This star symbolizes 6 more months of exacting service to our Armed Forces, delivering vital materials so necessary for ultimate Victory.

FOR VICTORY—BUY U. S. WAR BONDS and STAMPS 143-45

LINCOLN ENGINEERING COMPANY
PIONEER BUILDERS OF LUBRICATING EQUIPMENT
5701 NATURAL BRIDGE AVENUE, ST. LOUIS 20, MO., U. S. A.



the entire heating surface is dipped in molten lead alloy

modine BLAST HEATERS

...perfectly adapted for food dehydration uses

To you as a dehydrator, this picture tells an important story—protection! Protection of the blast heaters designed for use in your dehydration tunnels. Protection of the blast heaters' steel tubes, fins, and headers against corrosion—corrosion that would otherwise result from the free moisture and acids from foods being processed—corrosion that would shorten the service life and rob the blast heater of much of its heat transfer capacity.

Dipping the entire heating surface in molten lead alloy, as pictured here, to secure a rust-resistant protective coating, is only one of the many details of Modine designed and built-in protection.

Modine Blast Heaters are the product of pioneer heat transfer specialists with a background of 27 years of knowing how—a financially sound organization with a recognized reputation.

Food processors doing war work can get Modine Steel Blast Heaters—Standard, or Steam Distribution Type—on an AA-5 priority, or better; or a repair order such as MRO.

Get Bulletins 342 and 342-A

MODINE MANUFACTURING COMPANY
1822 RACINE STREET, RACINE, WISCONSIN

ARMY E NAVY

Look in your phone book for Modine representative's name—"Where To Buy It" section

MEMBER OF NATIONAL DEHYDRATORS ASSOCIATION

P.M. SERVICE
ON THE FIGHTING FRONT

EQUALLY *ESSENTIAL* ON THE HOME FRONT

ACME NEWS PHOTO

With Allied Armies on the offensive, the speed of their advance depends to a great extent on how quickly supply lines can bring up food, fuel and fighting equipment. Since trucks—many of them GMC "six-by-sixes" — are the backbone of every supply line, Army mechanics are on the job at all times to keep 'em rolling. Many Army motor maintenance units are using the GMC Preventive Maintenance Plan—inaugurated by GMC dealers more than 15 years ago. Because your trucks on the home front are a vital part of this vast network of supply lines, it is equally essential that they should be kept in top condition. See your GMC dealer today and take advantage of his years of truck maintenance experience . . . his all-out truck-saving service.

Special "Service Payment Plan" available through our own YMAC

INVEST IN VICTORY . . . BUY MORE WAR BONDS

Pledged U.S. TRUCK CONSERVATION CORPS

GMC VICTORY MAINTENANCE KEEPS YOUR TRUCK ON THE JOB

THE TRUCK OF VALUE

GMC TRUCKS

GASOLINE - DIESEL

"EGAD! I'M IN ILL REPUTE"
AMERICANA
ENCYCLOPEDIA — the FLY acts as intermediate host for disease germs which develope in its blood to the point where they are virulent when introduced into the circulation of man or beast.

Yes, flies are universally recognized these days as the nasty, filthy carriers of such dread diseases as infantile paralysis; and the sight of them has a bad effect on your patrons. If you're fortunate enough to have a TANGLEFOOT DIFUSOR use it regularly with VICTORY DIFUSO LIQUID, the only safe and effective wartime alternate for genuine DIFUSO. It's the most effective method available to rid your premises of flies and all other insect pests. If you haven't a DIFUSOR, put it down at the head of your "want" list for after the war purchases. Write for information.

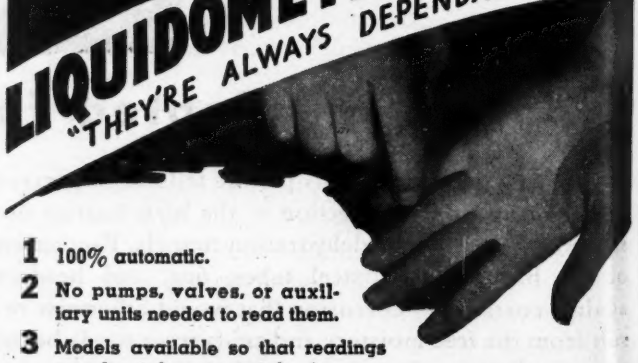
TANGLEFOOT VICTORY·DIFUSOR·LIQUID

THE ONLY ALTERNATE FOR GENUINE *DIFUSO* WHICH CAN BE SAFELY USED IN THE NOW IRREPLACEABLE *DIFUSOR*

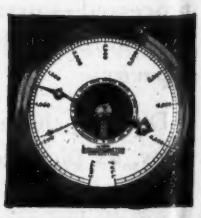
THE TANGLEFOOT CO. • GRAND RAPIDS, MICH.

5 Reasons Why We Measure Our Valuable Stored Liquids With LIQUIDOMETER *Tank Gauges*

"THEY'RE ALWAYS DEPENDABLE"

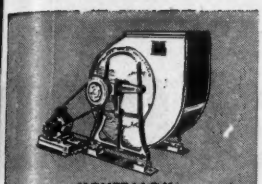


1. 100% automatic.
2. No pumps, valves, or auxiliary units needed to read them.
3. Models available so that readings can be taken remotely from or directly at the tank.
4. Accuracy unaffected by specific gravity of tank liquid.
5. Approved for gauging hazardous liquids by Underwriters' Laboratories and other similar groups.

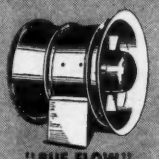


Write for complete details

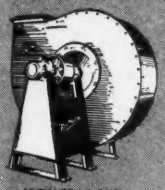
THE LIQUIDOMETER CORP.
38-14 SKILLMAN AVE., LONG ISLAND CITY, N.Y.



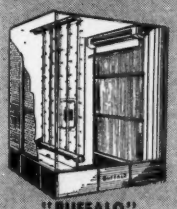
"BUFFALO"
Limit-Load Ventilating Fan



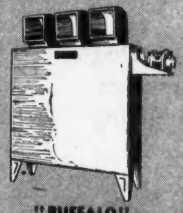
"BUF-FLOW"
Axial Flow Fan



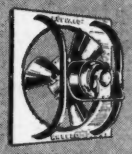
"BUFFALO"
MX Mill Exhauster



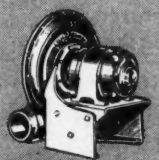
"BUFFALO"
Air Washer



"BUFFALO"
Highboy Unit Heater



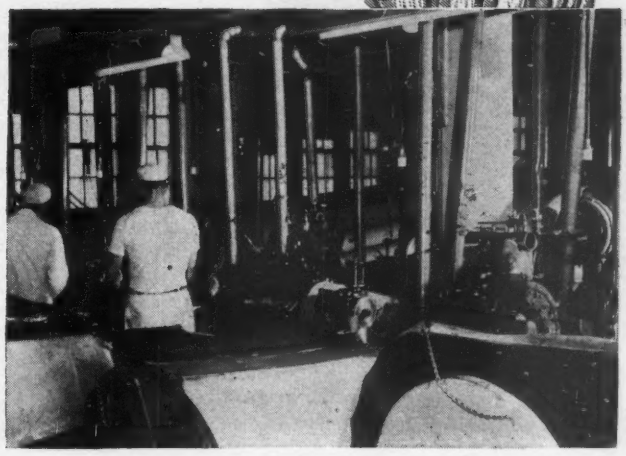
"BUFFALO"
Breeze Ventilating Fan



"BUFFALO"
Type E Blower

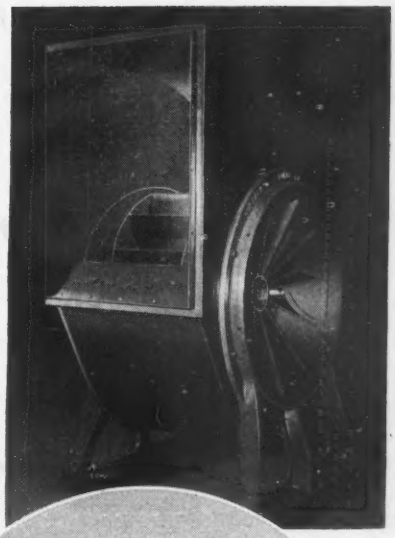
"BUFFALO"
Volume Fan

DOES CONTAMINATION ride the air-ways into your plant?



Hold air-induced spoilage to a minimum with effective "Buffalo" FANS AND AIR WASHERS

The most rigid sanitary rules for floors, equipment and employees are only half-way measures if the air is dirty. Buffalo air handling equipment offers effective, low-cost, easy-to-install safeguards for your plant's atmosphere. Buffalo Ventilating Fans in combination with Buffalo Air Washers provide clean, dust-free air, properly humidified and tempered, also cooled if required, to meet the highest standards of sanitary food processing . . . No matter how large or small the installation you require, there's the correct type and capacity of Buffalo equipment. Engineering data will be sent promptly on request.

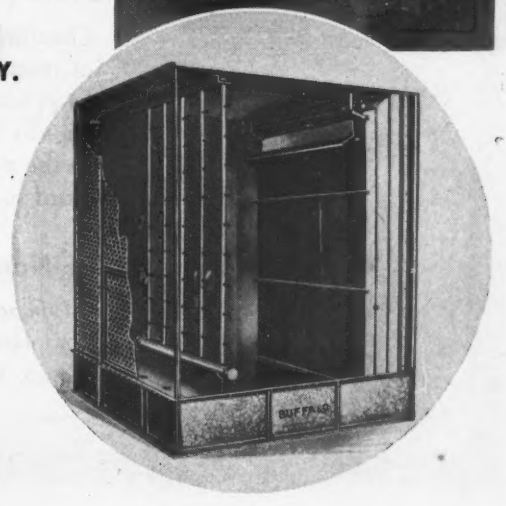


BUFFALO FORGE COMPANY
152 Mortimer St. Buffalo, N. Y.
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

ARMY E NAVY

"Buffalo"

HELPS YOUR PROCESSING "BREATHE" *CLEAN* AIR



Consult FOOD IN

● ***When you want Facts on Materials, Equipment and Supplies***

SECTION 1 →

Catalog Section—Turn to section One—here is manufacturers' catalog information, picturing and describing products of leading suppliers. Here are sizes, speeds, capacities—definite performance data giving you the detailed information.

● ***When you need New Food Formulas or Processing Information***

SECTION 2 →

Reference Section—Here is a collection of over 200 food formulas for all varieties of food products reprinted from FOOD INDUSTRIES. Food plant engineers find particular interest in the Flow Sheets which graphically show preparation, processing and packaging of a wide variety of foods.

● ***When you want to find the Firms who make a Certain Product***

SECTION 3 →

Classified Directory of Manufacturers—Here is a list of manufacturers of machinery, equipment and supplies. Names classified alphabetically by product, with catalogers names in bold face type, giving page reference to the catalog section. You will find more than 500 products used in the processing of food. In using this section look for the principal word such as "Filters", "Mixers", etc.

● ***When you want the Name and Address of a Specific Manufacturer***

SECTION 4 →

Alphabetical Company Name, Address, and Trade Name Index—A complete listing of the companies making the products listed in Section 3. This is the cross index that simplifies the use of the book.

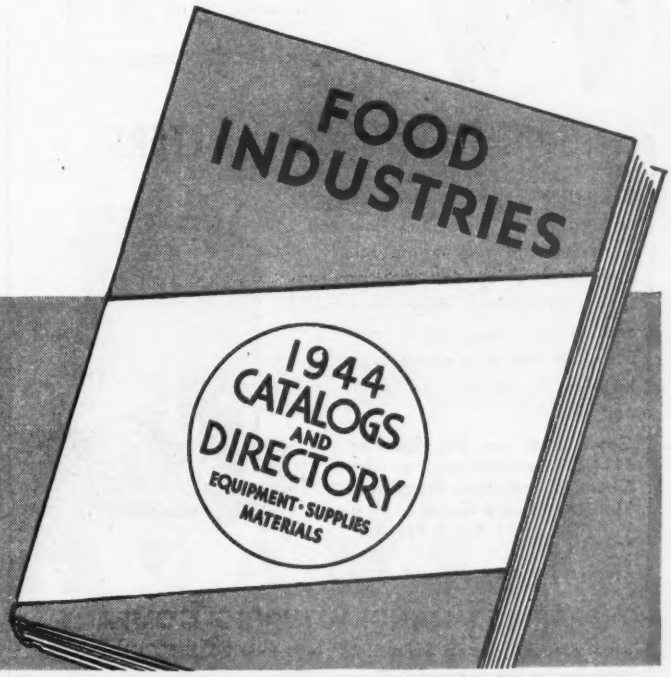
INDUSTRIES CATALOGS & DIRECTORY

WHEN: Planning raw material or equipment purchases
Considering making a new food product now or post war
Replacing obsolete equipment
Looking for new Sources of raw material
You need engineering help . . . Re-designing plant layout

The *new* 6th Edition of Food Industries Catalogs & Directory is now in the hands of Food plant men to aid them with a quick, comprehensive and reliable source of information.

War time needs and post war planning add a new interest and value to this book. The new edition has been compiled with these emergency and fast-changing needs in mind. You will find here the latest development in equipment, many sources of raw material, engineering and other services. There may be help here in solving many perplexing food plant problems.

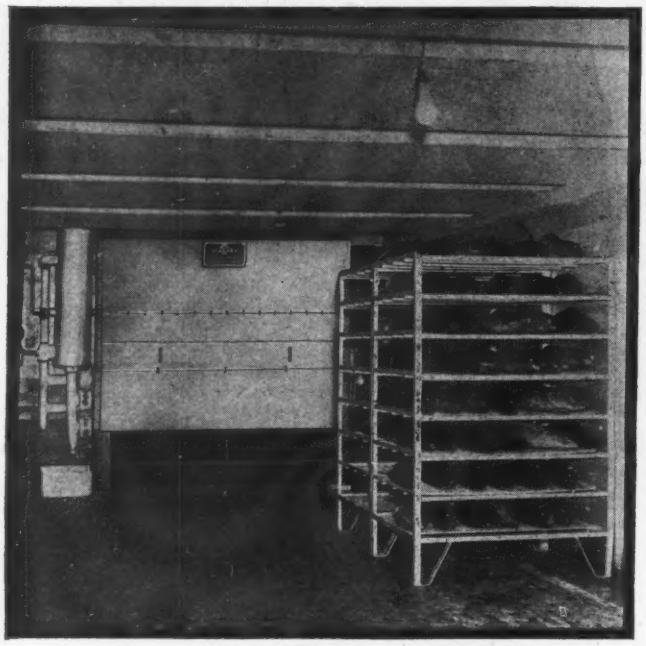
Food men route their copies of the F I C & D to the men of their organization responsible for planning, specifying and buying. They find it saves them time and often money to acquaint their men with this source of information and to have it readily available. You will find a copy in your plant. Use it when the next plant problem comes up.



FOOD INDUSTRIES
CATALOGS & DIRECTORY
A UNIT OF CATALOG AND DIRECTORY DIVISION
McGraw-Hill Publishing Company
330 W. 42nd St., New York 18, N. Y.

How to PRE-COOL or FREEZE

Fruits, Vegetables, Meats, Fish, before Dehydration, for Highest, Uniform Quality



PATENTED

● The NIAGARA "No Frost" System provides a reliable method for obtaining:

1. *Extreme low temperatures for freezing by the air method.*
2. *Greater economy in refrigerating space below 32° F.*
3. *More dependable refrigeration and better control of temperatures.*

The "No-Frost" Method eliminates icing of coils and increases the capacity of the compressor system, allowing an increase in refrigerated space without greater equipment cost.

Practical experience for many years. Users of NIAGARA "No-Frost" Systems are well known large concerns expertly processing large volumes of different foods.

Write for complete information and Niagara Bulletins 83 and 95. Address Dept FI-123.

NIAGARA BLOWER COMPANY

General Sales Office: 6 E. 45th Street, New York City

37 W. Van Buren St., Chicago — Fourth & Cherry Bldg. Seattle

District Engineers in Principal Cities

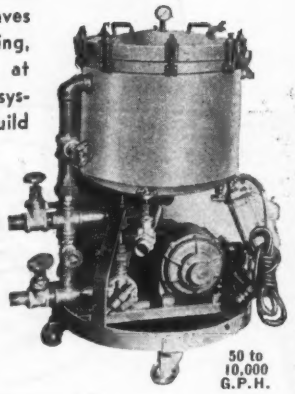
NIAGARA INDUSTRIAL COOLING • HEATING • DRYING HUMIDIFYING • AIR ENGINEERING EQUIPMENT

No room for doubt!

All the element of risk is eliminated when you filter liquid food products with

SPARKLER HORIZONTAL PLATE FILTERS

BECAUSE—Sparkler filtration leaves nothing to be desired in purifying, clarifying and renovating liquids at high rates of speed. Enclosed system, motor-driven filters that build and retain larger filter aid cake, are simple to clean, economical to operate, compact and portable.



50 to 10,000 G.P.H.

Come and see the Sparkler filter demonstrated at the Chemical Industries Exposition, Madison Square Garden, New York, Dec. 6-11, Booth No. 615.

Write for any special details

SPARKLER MANUFACTURING COMPANY

277 Lake Street, MUNDELEIN, ILLINOIS

PACKAGES

- CAPEM Screw Caping Machines are fully automatic.
- Seal from 2000 to 7500 containers per hour—LEAKPROOF.
- Save from 2 to 5 operators per machine.
- Handle jars, bottles or jugs of any size or shape.
- Use any type of metal or plastic screw cap—and certain acceptable substitutes.

Write for complete information

CONSOLIDATED PACKAGING MACHINERY CORP.

1400 WEST AVENUE — BUFFALO, N. Y.

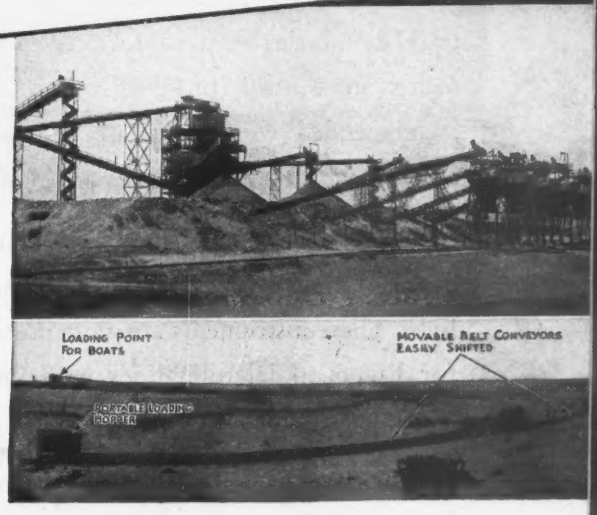
AS TIME GOES BY...

Designs Change ... but S-A Quality Remains the Same

● Changing times bring changing needs. The need for new and better labor-saving, conveying methods is always present. We at Stephens-Adamson have always held it primarily important not only to stay abreast of new developments . . . .but to anticipate and constantly plan for them.

Right now, this aspect of S-A activity has *double* significance . . . (1) the solution of your present problems . . . (2) the solution of new handling problems connected with new processes and products contemplated for the post-victory world.

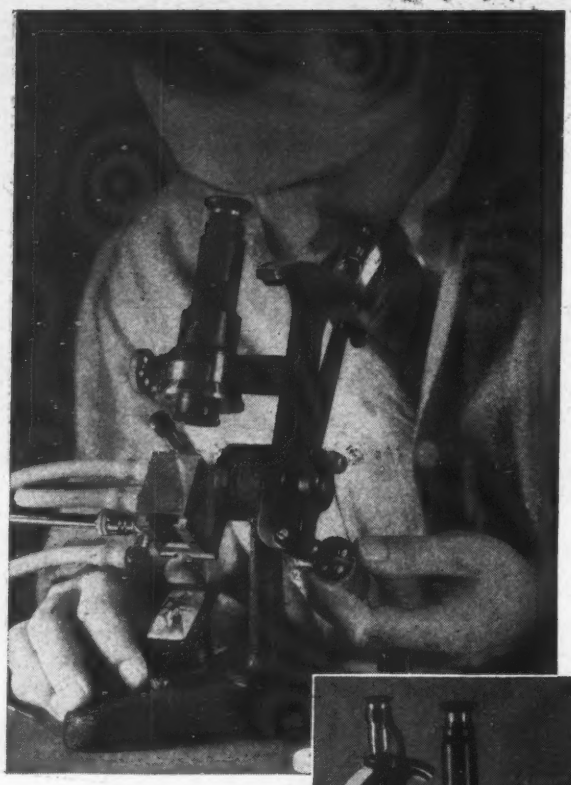
STEPHENS-ADAMSON MFG. CO., 6 Ridgeway Ave., Aurora, Ill.

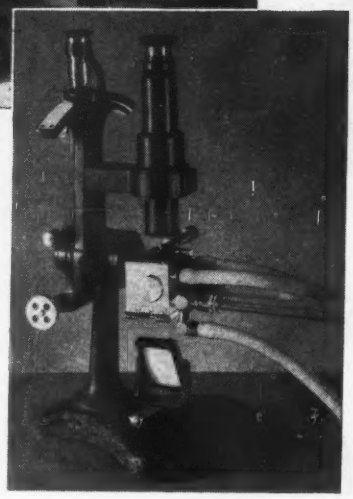


STEPHENS-ADAMSON MFG. CO.

Designers and Manufacturers of All Types of

BULK MATERIAL HANDLING EQUIPMENT





At Right: The Spencer Refractometer, without Amici prisms for use with monochromatic light.

Process Control—Refractive Index

Increasingly, industrial laboratories are using refractive index measurements to control processes. This procedure is recommended where accurate results are needed quickly, where small samples are an advantage.

Refractometers may now be obtained without compensating prisms for use with monochromatic light. These instruments are more precise, especially for dispersion determinations, and eliminate one of the manipulations involved in taking readings.

Instruments are available for essential use.

ARMY E NAVY

Spencer LENS COMPANY
BUFFALO, NEW YORK
SCIENTIFIC INSTRUMENT DIVISION OF
AMERICAN OPTICAL COMPANY

U·S·S CYCLONE METAL CONVEYOR BELTS SPECIALLY DESIGNED FOR *Food Dehydration*

THESE belts are practically made to order for transport of food particles during dehydration. They are strong, flexible, closely woven. Available in meshes as small as 3/32"—small enough to handle finely diced vegetables. Free passage of air is assured—for by far the larger part of the belt area consists of openings. **Cyclone Stainless Steel and Tinned Steel Belts** can well withstand the corrosive effects of the hot, humid air in food dehydrators. For other product conveyance, use galvanized Chain Link or Flat Wire Belts—available in a wide range of widths, weights and sizes of mesh.

Free Information. If you have problems of product conveyance ask for the help of our experienced engineers and let us furnish the necessary belts promptly.

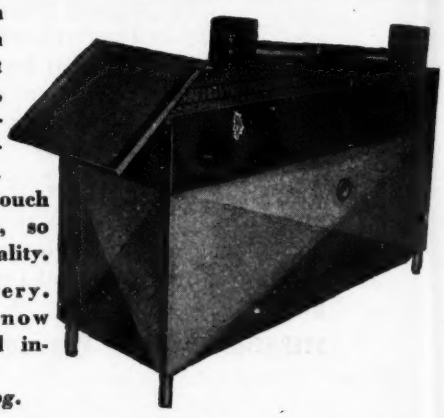
CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
Waukegan, Illinois · *Branches in principal cities*
United States Steel Export Company, New York

USS CYCLONE "Red Tag" METAL CONVEYOR BELTS

CYCLONE
METAL DEHYDRATION BELTS
UNITED STATES STEEL

Cut Bottle Unloading Cost When Converting to Glass

With a Styl-O-Matic Infeed and Unscrambling Table, *one* operator can unload 150 of any size bottles, jars or containers per minute from cartons onto conveyor, which discharges them to filler in single line, without breakage. This is more than *two* operators can handle by hand. It reduces labor costs, increases production, saves breakage and floor space. Operator doesn't touch mouth of bottles, so sanitation is a reality.



Prompt delivery. High priorities now available for food industries.

Write for catalog.

ISLAND EQUIPMENT CORP.
101 Park Avenue — New York, N. Y.

Styl-O-Matic Unscrambler

Protect your business by taking care of your equipment

It's good sense to give *all* your equipment the best of care. It's patriotic, too, for the government urges everyone to make things last.

Much of your equipment cannot be replaced till the war is over. Spare parts may be hard to get—and the service men to install them are busier than ever.

So give your equipment a little *extra* care ...a few simple precautions may add months or years to its life.

To owners of G-E Air Conditioning, G-E Commercial Refrigeration

OIL your equipment regularly (as per oiling instructions given for it) in order to avoid burned-out bearings.

CLEAN your equipment. Dust and dirt can do great harm to moving parts—accelerating wear and causing breakdowns.

ADJUST belts for tension and alignment. Simple wrench adjustments can prevent needless wear of precious rubber.

These three simple jobs which your own maintenance man can do—oiling motor bearings, cleaning, adjusting belts—will go a long way toward keeping your equipment working efficiently. Be sure all three jobs are done regularly. When *expert* attention is needed, call in the G-E service man at once... give him an opportunity to correct the trouble before it becomes serious.

General Electric Company, Air Conditioning and Commercial Refrigeration Divisions, Section 38912, Bloomfield, New Jersey.

☆ BUY WAR BONDS ☆

GENERAL ELECTRIC

Hear the General Electric Radio Programs: The "G-E ALL-GIRL ORCHESTRA," Sundays 10 P. M., EWT, NBC..."THE WORLD TODAY" News, Every Weekday, 6:45 P. M., EWT. CBS

Production Problems Aren't Identical Twins!

That's Why You Need Individualized Equipment

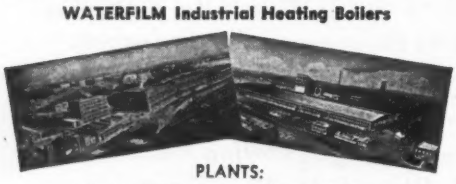
If all problems were alike, meeting production schedules would be easy. But each problem has its own difficulties and requires special attention.

For many years, KOVEN has designed and fabricated equipment for successful food manufacturers, speeding up production efficiently and economically. Whatever your needs, KOVEN'S skilled engineers will work with you to plan and build equipment to solve your wartime and post-war production problems. Phone or write KOVEN today.

Among the many KOVEN products in all the leading commercial and non-corrosive metals:

- **Stainless Steel**
- **Aluminum Sheet Fabrication**
- **Boxes, Tote, Waste Cans**
- **Chemical Apparatus**
- **Coils and Pipe Bands**
- **Copper Sheet Fabrication**
- **Galvanizing Work**
- **Mixers, All Kinds**
- **Monel Metal Fabricator**
- **Pails, Special Heavy**
- **Pans, All Types, All Metals**
- **Sinks, Scullery and Factory**
- **Tables, Galvanized or Monel**
- **Tanks, All Types, All Metals**
- **Kettles, All Types, All Metals**

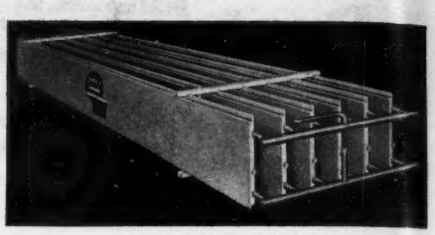
WATERFILM Industrial Heating Boilers



PLANTS:
Jersey City, N. J. Dover, N. J.

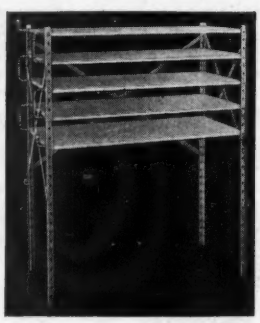
L. O. KOVEN & BRO. INC.

154 Ogden Avenue
Jersey City, N. J.



Dole Locker and Storage Plates Available in different sizes

Quick Delivery to priority rated users
DOLE *Vacuum Plate* REFRIGERATING UNITS



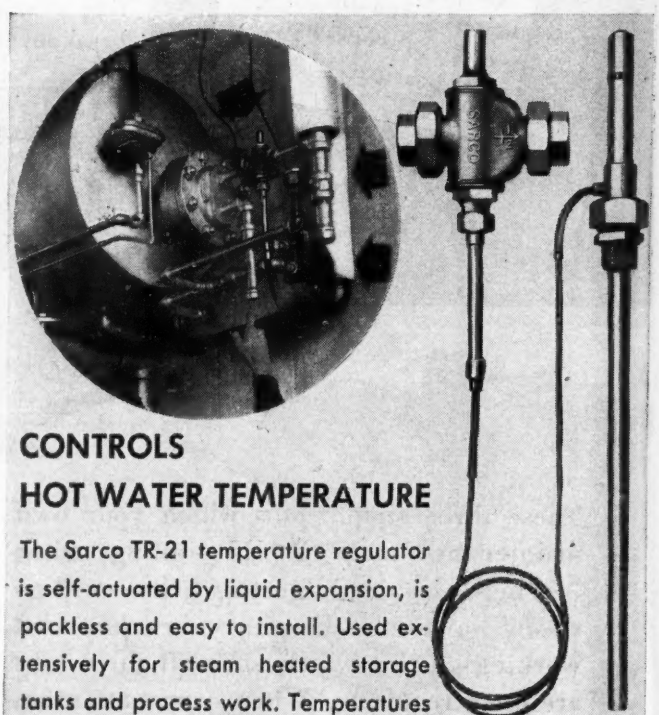
Quick Freeze Plate Unit Available in different Sizes

- **QUICK FREEZING**
- **PRESERVING AND**
- **TRANSPORTING FOOD — so vital to War, Peace and Life**

Dole Refrigeration is *Efficient, Economical* to operate, *Easy* to *Install* and *Defrost*, requires little space

Write for catalogs

DOLE REFRIGERATING COMPANY
5910 N. PULASKI RD., CHICAGO 30, ILL.
N. Y. Branch: 55 W. 42nd St., New York 18, N. Y.



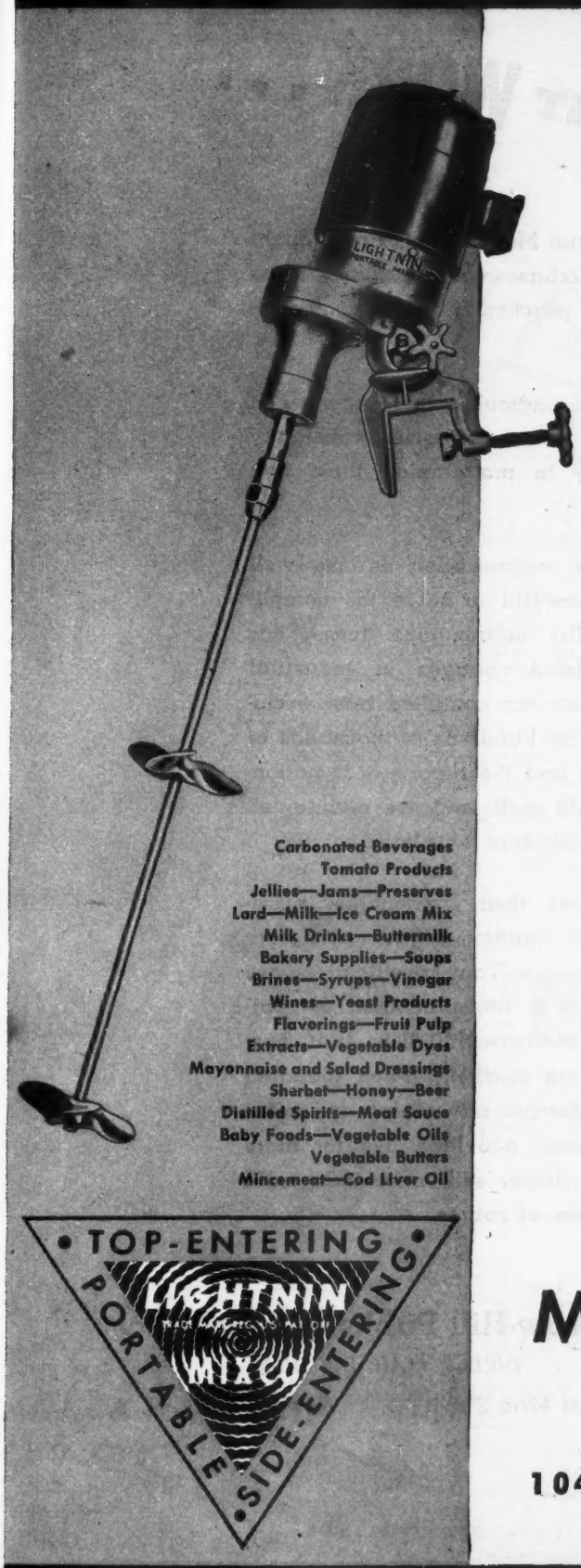
CONTROLS HOT WATER TEMPERATURE

The Sarco TR-21 temperature regulator is self-actuated by liquid expansion, is packless and easy to install. Used extensively for steam heated storage tanks and process work. Temperatures 0° to 400° F., pressures to 175 lbs. Ask for Catalog No. 600.

Sarco TR-21 Temperature Regulator

SARCO SAVES STEAM
SARCO COMPANY, INC.
475 Fifth Avenue, New York 17, N. Y.
SARCO CANADA, LTD., 85 Richmond St. W., TORONTO, ONT.
171

"LIGHTNIN" DOUBLE ACTION



helps to speed up food *Processing*

There are certain places in the food plant where the installation of a "Lightnin" Mixer is, in effect, the equivalent of adding duplicate processing equipment because proper agitation speeds up food processing. If your problem is one of greater production, perhaps a "Lightnin" Mixer is the answer. Mixing Equipment Company's 25 years of experience is yours for the asking.

There is a process adapted agitator for every size and shape of tank and every operation; for batch or continuous operation. Because Mixing Equipment Co. products include *all* types of fluid agitators, you can obtain from them an impartial recommendation for the most economical solution of any problem involving fluid agitation. Mixing Equipment Co. engineers will gladly assist you in solving your particular agitation problem.

• Portable Mixers, Geared or Direct Drive—⅛ to 10 H.P. Top Entering Units for pressure or vacuum vessels, ¼ to 50 H.P. Side Entering Units for horizontal use, 1 to 25 H.P.

MIXING EQUIPMENT CO., INC.

1043 GARSON AVE., ROCHESTER 9, N. Y.

MAILING LISTS THAT WORK . . .

McGraw-Hill Industrial Mailing Lists are a direct route to today's purchase-controlling executives and technicians in practically every major industry.

These names are of particular value now when most manufacturers are experiencing constantly increasing difficulty in maintaining their own lists.

Probably no other organization is as well equipped as McGraw-Hill to solve the complicated problem of list maintenance during this period of unparalleled changes in industrial personnel. These lists are compiled from exclusive sources, based on hundreds of thousands of mail questionnaires and the reports of a nation-wide field staff, and are maintained on a twenty-four hour basis.

Investigate their tremendous possibilities in relation to your own product or service. Your specifications are our guide in recommending the particular McGraw-Hill lists that best cover your market. When planning your industrial advertising and sales promotional activities, ask for more facts or, better still, write today. No obligation, of course.

McGraw-Hill Publishing Co., Inc.
DIRECT MAIL DIVISION
330 West 42nd Street New York, 18, N. Y.

Standard Line

FOOD JARS

Glass packaged foods really sell fast. Now there is more reason than ever to pack in glass . . . Uncle Sam has requested it. The new Foster ★ Forbes standard line of jars have smaller closures to save much needed metal . . . are lighter in weight to conserve glass and minimize shipping costs . . . are made in a range of sizes ideal for salad dressings, nut butters, preserves, pickles, fruits, vegetables, etc. If you are going to pack in glass . . . jars or bottles . . . get in touch with us for samples and prices.

FOSTER★FORBES

GLASS COMPANY

MARION, INDIANA, U. S. A.

GLASSWARE OF QUALITY AND CHARACTER

SALES REPRESENTATIVES

KANSAS CITY - DETROIT - CHICAGO - CLEVELAND
MILWAUKEE - CINCINNATI - LOUISVILLE - ST. LOUIS
ATLANTA - ST. PAUL - NEW YORK - MEMPHIS
HAVANA, CUBA

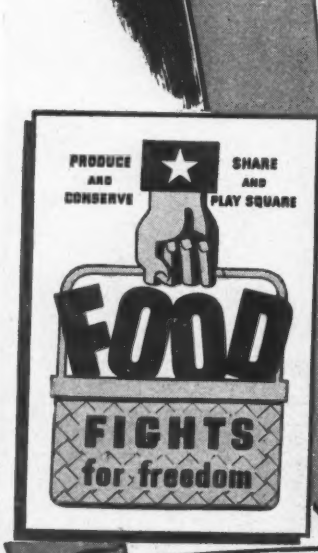
A letter you'll want to read twice!

... and honestly, Mom, I never realized what food means in a war until we got into [redacted]. Little kids with swollen bellies and peaked pasty faces crowded round us like starved dogs..... men and women cried out, "Bread, bread, bread!"....then as we went up the [redacted] of Italy, it was the same thing all over again.

I only wish you and Dad could have seen the change in these people when we came in with food. When we pushed on, we sure left friends behind us.

If everybody back home could just see this once, they'd grow a Victory Garden, all right.... and the farmers would grow more than they thought they could, too.... and everybody from Dan in the Diner to Mr Bell running the Palace Restaurant, Tony at the fresh fruit and vegetable stand, and even Jim our own grocer would realize they can really shorten the war and get all of us home quicker by not letting a single scrap of food go to waste. They'd handle food as carefully as we handle our guns and tools.

Mom, food *is* a weapon! It saves lives! I've seen it happen.



Make Food Fight for Freedom—DO YOUR PART!

1. Make everyone fully aware that it is vitally important to Produce and Conserve, Share and Play Square with food.
2. Inform America! Include Food Fights For Freedom messages in every advertisement.
3. Display the official Food Fights For Freedom posters and window signs.
4. The Food Fights For Freedom Program must go on month after month, as long as the war lasts... for Food is a Vital Weapon!

Prepared for the Food Fights For Freedom Program with the cooperation of the War Advertising Council

Space Contributed by Food Industries

Production Contributed by Del Monte Foods

OVERSEAS SHIPMENTS DEPENDABLY PROTECTED·

WHEN SEALED WITH EXPORTEX WATERPROOF GLUES

PROTECTS ALL PRODUCTS

Chemical Warfare Supplies: .Signal Corps Equipment; Navy Supplies; Medical Supplies and Equipment; Engineering Corps Equipment; Lend Lease Foods and Supplies; Red Cross Supplies, etc.

Gun Parts; Shells; Cartridges; Aircraft Instruments and Parts; Plane Assemblies and Spare Parts; Tank Parts; Vehicle Supplies; Canned Foods; Dehydrated Foods; Army Field Rations; Wearing Apparel, etc.

FREE TECHNICAL DATA BULLETINS: Write for Adhesive Problem Data Sheet and Technical Bulletins describing PAISLEY War Packaging Adhesives.

Check these features

Here are a few reasons why PAISLEY EXPORTEX WATERPROOF GLUES are accepted by Procurement and Inspection Agencies, A. S. F. Depots and Leading War Plants in all industries:

1. EXPORTEX provides almost instantaneous sealing of waterproof bags, case linings, asphalt laminated and impregnated wrappings.

2...EXPORTEX is ready to use. No heating. No messy solvents or mixing required.

3. EXPORTEX is easily applied to bag seams, lining overlaps and carton flaps by hand brushing or regular glue sealing machines.

4. EXPORTEX withstands many days of water immersion. Meets Export Packing Specifications with a wide margin of safety.

Wire, 'phone or write today, stating what and how you pack and ship, for complete prices and specific details.

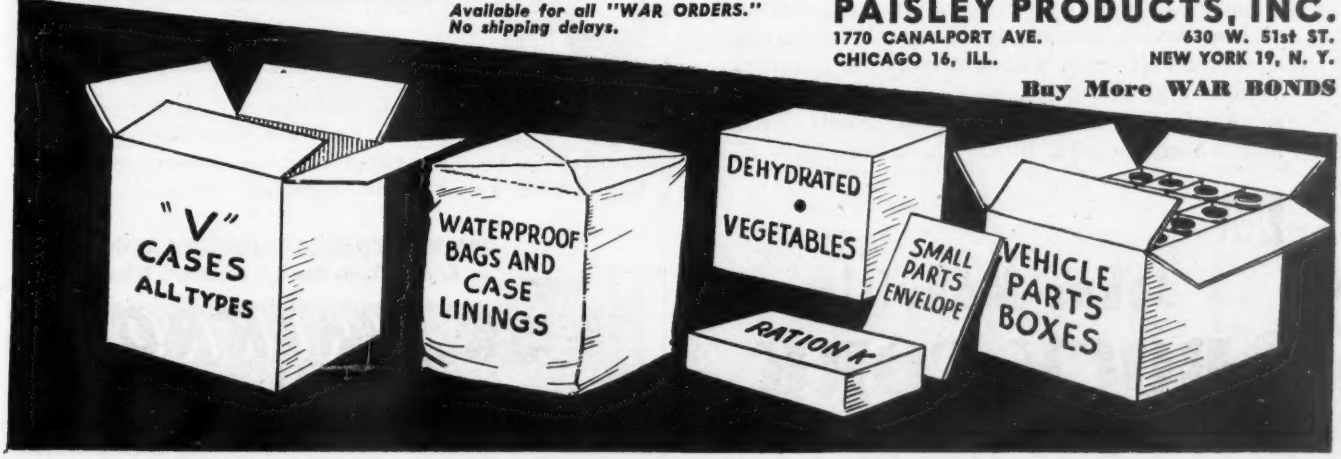
Available for all "WAR ORDERS." No shipping delays.

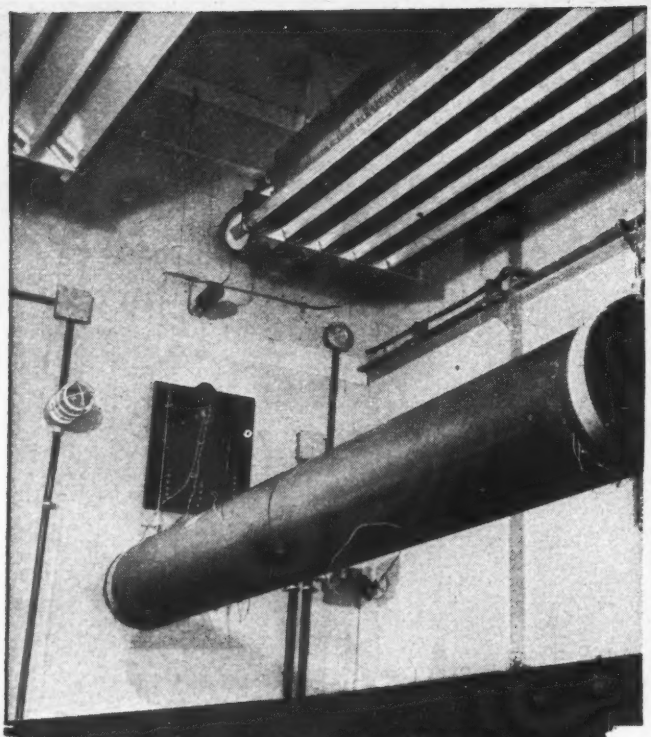
PAISLEY PRODUCTS, INC.

1770 CANALPORT AVE. CHICAGO 16, ILL.

630 W. 51st ST. NEW YORK 19, N. Y.

Buy More WAR BONDS





We manufacture cold to prove ROCK CORK'S efficiency

A VIEW OF THE JOHNS-MANVILLE "COLD ROOM" where insulations for service in the low temperature range are tested. The temperature in this room can be automatically regulated and kept constant.

In the JOHNS-MANVILLE insulation laboratories—among the best equipped in the world—specially trained technicians subject low temperature insulation materials to conditions even more severe than they will have to face in actual service. J-M Rock Cork, widely used in low-temperature insulation service, meets the most exacting tests of these laboratories.

Formed by an interlacing of mineral fibers, J-M Rock Cork is exceptionally successful for all kinds of cold-storage construction. Factors responsible for its wide use are low conductivity at low service temperatures, non-absorption of moisture and odor, and immunity to termites, vermin and mold. Available in sheets and as sectional pipe covering. For full details, write Johns-Manville, 22 E. 40th St., New York, 16, N. Y.

JM

Johns-Manville
ROCK CORK

SYNTRON

"Vibra-Flow"

VIBRATING SCREENING FEEDERS

The Screening Feeder shown above is one of twelve in a dehydrating plant.

Used for washing and screening fines out of diced vegetables, and also to control the filling of the dehydrating trays.

Screening Feeders are also used to both remove foreign objects from food materials, and control their flow to processing machines—pulverizers, driers, mixers, weight packers, etc.

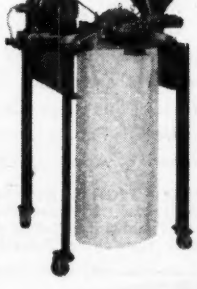
Available in various sizes, capacities and styles.

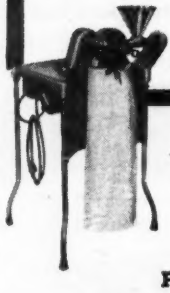
Write us about your problem.

SYNTRON CO., 460 Lexington Ave., Homer City, Pa.

UNSKILLED HELP

Trained manpower is not needed for the operation of dustless Mikro-Pulverizers. A new man (or woman) can get to work on a Mikro and in five minutes you'll be enjoying all the advantages of fine grinding with particle sizes *mechanically* controlled. Mikro-Pulverizers reduce pulverizing costs all along the line. They cut power costs, save floor space, cut cleaning time in half. Send for 32 page catalog.



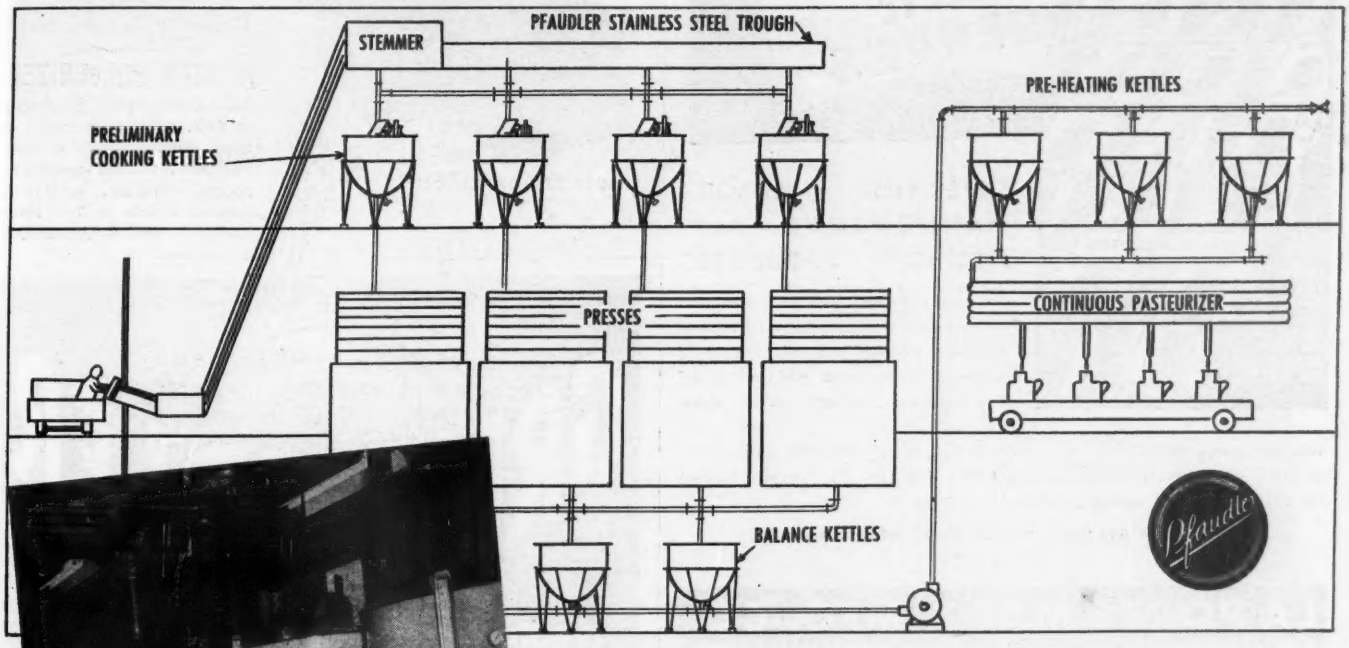


IF YOU ARE WORKING WITH FOOD DEHYDRATION AND NEED GRINDING EQUIPMENT, TELL US ABOUT YOUR GRINDING PROBLEMS.

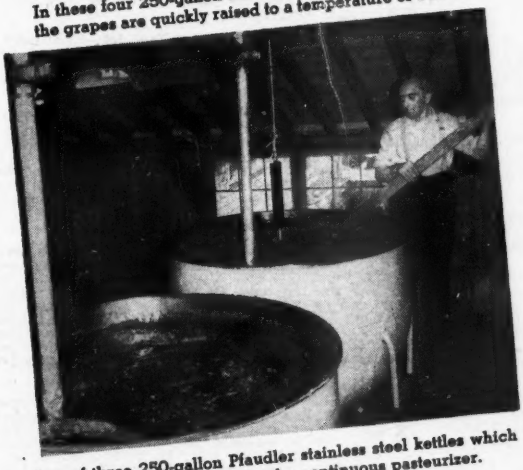
PULVERIZING MACHINERY COMPANY
97 Chatham Road • Summit, New Jersey

FROM GRAPE TO JUG IN 30 MINUTES

Pfaudler Stainless Steel Jacketed Kettles Help Widmer's Meet Demand of Armed Forces for Grape Juice



In these four 250-gallon Pfaudler stainless steel cooker-mixers, the grapes are quickly raised to a temperature of 140°.



Two of three 250-gallon Pfaudler stainless steel kettles which are used as balance tanks for the continuous pasteurizer.

WIDMER'S WINE CELLARS, INC., Naples, New York, lose little time in converting luscious, sun-ripened Concord Grapes into delicious grape juice for Uncle Sam's fighting men. It's all done in thirty minutes! Flavor and quality are protected in vital stages by Pfaudler Stainless Steel Jacketed Kettles.

Carried to the third floor by conveyor, incoming grapes are put through a stemming machine. Free of stems, they pass to a Pfaudler stainless steel trough where a filtering aid is added. They next flow by gravity into four 250 gallon Pfaudler Stainless Steel Jacketed Cooking Kettles equipped with stainless steel agitators with variable speed drives. Here, they are heated to 140° F. to extract the natural grape color and flavor which make Widmer's product so appetizing.

The heated grapes flow to four hydraulic presses on the floor below which have a capacity of 3000 gallons per hour. Below these presses are three more Pfaudler Stainless Steel Kettles which serve as balance tanks for the pressed juice. From there, juice is pumped to three 250 gallon Pfaudler Stainless Steel Jacketed Kettles (without agitators) which maintain the temperature of the juice at 120° F. From these kettles, juice flows by gravity to a continuous pasteurizer automatically controlled at 180° F., which in turn supplies four filling lines.

Specify Pfaudler Stainless Steel Jacketed Kettles for Speedy Production and Easy Cleanability. If you have a food processing problem where maintenance of quality is important and which calls for production line speed, get in touch with Pfaudler. Pfaudler Jacketed Kettles, with or without agitators, are available in sizes ranging from 30 to 300 gallons. Get Bulletin 819.

PFAUDLER

THE PFAUDLER CO., Rochester 4, N. Y. Branch Offices: 330 West 42nd St., New York 18, N. Y.; 1442 Conway Bldg., Chicago 2, Ill.; 1325 Howard St., San Francisco 3, Calif.; 455 Paul Brown Bldg., St. Louis, Mo.; 7310 Woodward Ave., Detroit 2, Mich.; 1318 1st Nat'l Bank Bldg., Cincinnati 2, O.; 1228 Commercial Trust Bldg., Philadelphia 2, Pa.; 751 Little Bldg., Boston 16, Mass.; 1034 Washington Bldg., Washington 5, D. C.

SAVES TIME • LABOR MAINTENANCE and PROTECTS PRODUCTS

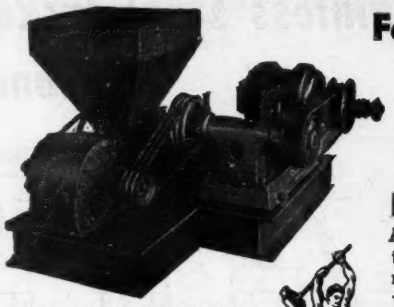
The most efficient, practical and economical conveyor belting for Pickling, Canning, Freezing and Dehydration on grading, sorting and picking tables, also in scalders, washers, cookers, elevators, etc.

Will not creep, weave nor jump, is easily and quickly installed, and readily sterilized with a steam gun or scalding water. The open mesh feature permits the circulation of air around products in process.

Furnished in any length and practically any width. Ask your Supplier TODAY.

LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA

GRUENDLER CRAFTSMANSHIP
Employed by U.S.A. in the WAR EFFORT



Food Processing Equipment
Meeting Different Products and Capacity Requirements

MASTER PULVERIZER
Adjustable from 30 mesh to 100 mesh and finer—a most popular type of pulverizer for food products, cocoa, sugar, grains, spices, whole wheat flour grains, etc. — Write our Engineers.

"DUSTLESS OPERATION"
Requiring no auxiliary separators, fans or collection attachments.
"Built in Many Sizes"
"Illustrated Bulletin on Request"

GRUENDLER
ST. LOUIS, U.S.A.
GRUENDLER

GRUENDLER CRUSHER & PULVERIZER CO.
PLANT and MAIN OFFICE—2915-17 N. MARKET • ST. LOUIS, MO.

GET THESE REPRINTS!

9 **Quality Separation by Differences of Density**—a unit operation of food engineering—by the editor of Food Industries, Dr. L. V. Burton. This is a specially bound, 15-page article of interest to all food manufacturers. Contains 16 charts, diagrams and photographs, 35 cents each.

11 **Magazine Feeds Solve Some Package Wrapping Problems**—Methods of feeding packages to the wrapping machines—type and rate of production determine what kind of feed should be used—construction and operation are explained in detail. Reprinted from Sept. 1936 issue. 10 cents each.

12 **Materials Handling**—Every branch of the food industries uses this operation to reduce manufacturing cost and coordinate processes. This article covers practically anything that cannot be handled in pumps. Reprinted from October 1936 issue. 10 cents each.

15 **Centrifugal Separation**—A unit operation that permits economy in the separation of solids or liquids from other liquids, strictly mechanically. Descriptions, types and uses in the food industries are discussed. Reprinted from April 1937 issue. 10 cents per copy.

17 **Minimum Quality Standard for Canned Tomatoes**—as issued by the U. S. Dept. of Agriculture, Food and Drug Administration—with authentic color swatch. Price 10 cents each.

18 **Tentative United States Standards for Grades of Frozen Lima Beans**—as issued by the U. S. Dept. of Agriculture, Agricultural Marketing Service—with authentic color swatch. Price 10 cents each.

19 **Tentative United States Standards for Grades of Frozen Peas**—as issued by the U. S. Dept. of Agriculture, Agricultural Marketing Service—with authentic color swatch. Price 10 cents each.

20 **Public Relations for Industry**—a presentation of the imperative needs of mutual understanding in the conduct of our daily work . . . with special reference to the food industries. 10 cents each.

22 **1942 Edition Frozen Foods directory.** Lists companies engaged in packing frozen food, together with the location of their plants, brand names, products packed, containers and systems used, and output. 35 cents each.

24 **Tentative United States Standards for Grades of Canned Grapefruit Juice**—as issued by the U. S. Dept. of Agriculture, Agriculture Marketing Service—with authentic color swatches. Price 15 cents each.

25 **Tentative United States Standards for Grades of Dried Prunes** as isued by the U. S. Dept. of Agriculture, Agricultural Marketing Service—with authentic color swatches. Price 10 cents each.

32 **A symposium by some of the couuntry's leading authorities on Consumer Research**—reprinted from the March, 1941 issue. It tells how to secure a true picture of consumer reactions to your products and how to interpret these facts in adapting your product to meet their requirements or satisfy their particular preferences. 20 cents per copy.

33 **U. S. Inspection and Grading** — Published originally in the May, 1941 issue of Food Industries, this 32-page reprint contains seven important articles profusely illustrated with photographs from the field. Article titles include: "First User of A.M.S. Tells Why"; "Manufacturers' Brands Benefit From A.M.S. Shield on Labels"; "A.M.S. Inspection Means More Sales at a Profit"; and "What's Behind U. S. Inspection and What It Involves". 20 cents per copy.

34 **How to Control Vitamin Content**—a 32-page symposium of experience with vitamins in foods on an industrial scale reprinted from June, 1941 (32 pages) and July, 1941 (12 pages). Both sections, while they last at 50 cents per set.

35 **Controlled Atmospheres**—Why "controlled atmospheres" are important to you; what they can do for you, and applications in the Food Industries. 48 pages. Reprinted from June, 1936 issue. 25 cents each.

37 **Preference Ratings Are Your Job**—Eight pages. Priorities and allocations. What to look for and how to make the most of your findings are told in this article. Reprinted from January 1942 issue. 20 cents each.

38 **Protect Your Plant from Bombs and Sabotage.** Food Processing plants must guard against air raids and sabotage because it is a war necessity to keep the production of processed foods at a high level to feed the armed forces and civilians of the United Nations. Effective plant protection, setting up lines of authority, and duties within the plant are covered in this article reprinted from February 1942 issue . . . 4 pages. . . . Free of charge.

39 **Food Must be Packaged . . . Even in Wartime.** Restrictions on materials have made packaged difficult. The largest food production in this country must be packaged in 1942. Many things can be done and are being done to alleviate the situation. . . . 12 pages summarizing the steps being taken by manufacturers of packaging materials, packaging machinery, food packers and the government. Reprinted from April 1942 issue. . . . 12 pages. . . . 25 cents per copy.

40 **Flow Sheets of the Food Industries.** Developed by Food Industries and specifically designed for production men to give them basic information on standard processes in use throughout the food processing field. Size, 8½ x 11 inches, attractively bound in paper folder. 36 pages. . . . 50 cents per copy.

FOR QUICK RESULTS MAIL COUPON TODAY ←

FOOD INDUSTRIES, 330 W. 42nd St., New York, N. Y.

I have circled below the reprints I want and enclose check ( ) cash ( ) covering cost. Please mail at once.

9 11 12 15 17 18 19 20 22
24 25 32 33 34 35 37 38 39 40

Name .....

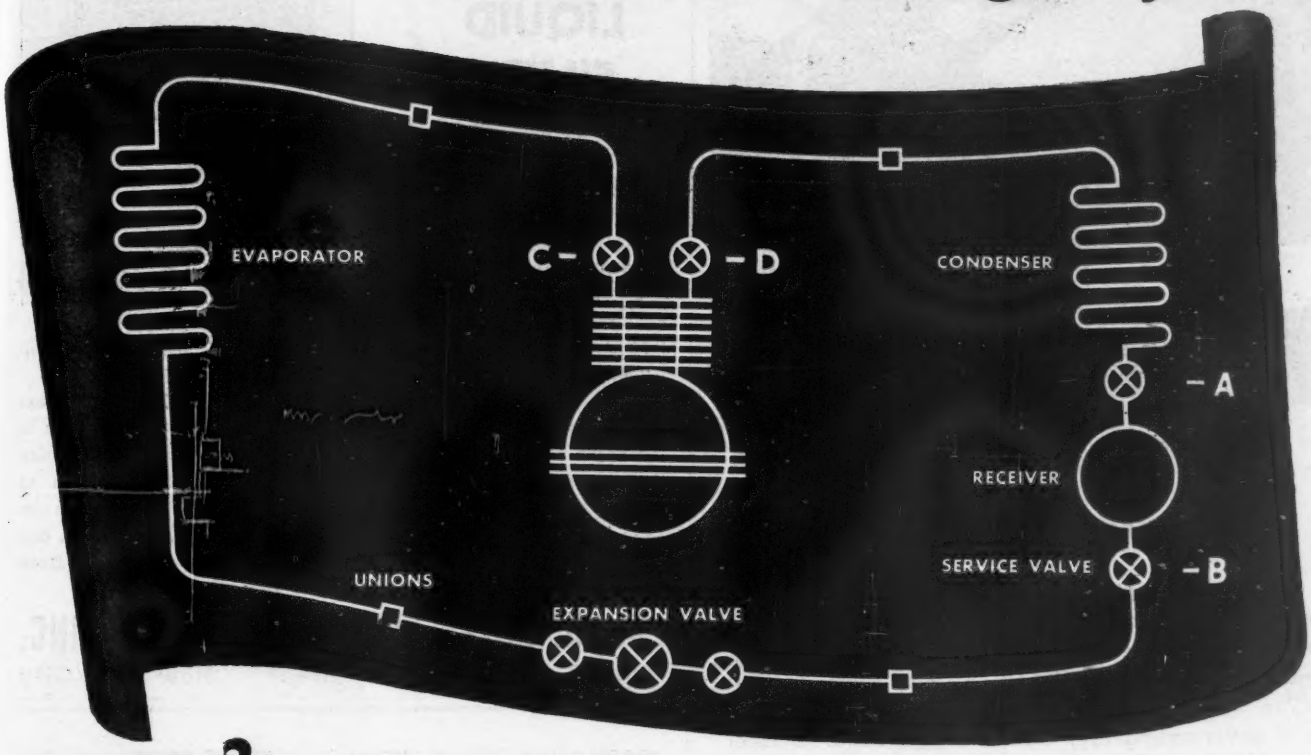
Company .....

Street .....

City & State .....

MAINTENANCE TIPS

for "FREON-12" charged Systems



NO. 2

SHUTTING DOWN SYSTEMS

Check these important points on shutting down "Freon-12" charged systems during cold months, or during other periods when operation of the equipment is not required. These tips will help you conserve "Freon-12"—save you time, trouble and expense.

1. Determine the capacity of the receiver. (See diagram.) Make certain it will hold the entire charge of "Freon-12," and still have a void or gas space which is 10% of the receiver's volume. This extra space is required to allow for expansion of the liquid refrigerant at higher temperatures, and eliminates the possibility of bursting the receiver because of hydrostatic pressure.
2. When the receiver is not of adequate capacity, close valve "B", shown above. Operate the compressor, to evaporate all liquid in the line between valve "B" and valve "C". "Freon-12" then condenses, flows into receiver. Reduce the back pressure to from 2 to 5 pounds gauge reading, then close valve "A".
3. When the receiver is not of adequate capacity, close valves "A", "B", "C" and "D" to isolate the refrigerant in separate sections of the system.
4. Test all valves to guard against leaks during the shut-down period. Send for free reprints of our previous advertisement in this series explaining "Leak Detection and Correction."

Pass this page along to others in your business who may be concerned with the operation and maintenance of "Freon-12" charged systems. Write today for as many free reprints of this advertisement as you need, or for any further information we can supply which may be of help. Address: *Kinetic Chemicals, Inc., Tenth and Market Streets, Wilmington 98, Delaware.*

★

BUY A WAR BOND EVERY MONTH

KINETIC

FREON

REG. U. S. PAT. OFF.

safe refrigerants

"Freon" is Kinetic's registered trade mark for its fluorine refrigerants

Sales, Engineering, Service and Production Executives in Conference at CRCO to review Equipment for 1944 Season.

PLANNING

For greater production in 1944 to meet increasing need for more and more food

Changing conditions, increased demands as captive nations are liberated, manpower shortages, critical materials . . . these are but a few of the problems that Canners . . . and CRCO . . . must solve.

The world is calling for food . . . MORE food . . . in a never-ending cry. Canners, ever eager to meet their Nation's call, are looking for methods to increase production in the face of the greatest labor shortage the country has ever known.

Here at CRCO, our entire facilities have been geared to meet this demand . . . to supply the type of Canning Equipment which is designed to take the overloads and release manpower for the fighting forces.

If your problem is new and better equipment, CRCO is the answer . . . but you should cover your requirements NOW!

Chisholm-Ryder

Company, Incorporated
NIAGARA FALLS, N.Y.

Branch Office and Warehouse
COLUMBUS, WISCONSIN

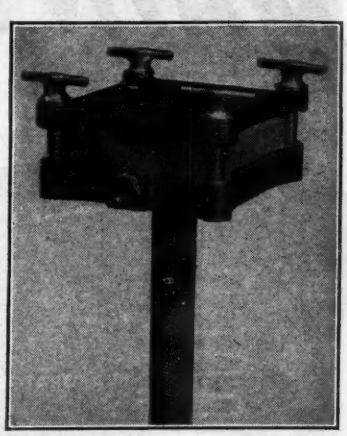
CRCO REPRESENTATIVES: A. K. Robbins & Co., Inc., Baltimore, Md.; Jas. Q. Leavitt Co., Ogden, Utah, and Seattle, Wash.; Lenfestey Supply Co., Tampa, Fla.; L. C. Osborn, Harlengen, Tex.; W. D. Chisholm, Niagara Falls, Canada.

THE BEST OF *Everything* FOR THE CANNER

A-2

TAKE OUT SOLIDS

with the RAPID FLO LIQUID FILTER



Used for over two years for MILK and WATER, the new Rapid Flo Filter can be used to take out solids from practically any liquids. A head pressure of 15 pounds is sufficient to enable liquid to pass through the special RAPID FLO FILTER. Gravity flow may be used. For quicker filtration a pressure pump feed may be used.

The filter head is made from Ambrac, a solid high nickel content metal. It is rust-proof and corrosion resistant. The filter medium is the Rapid Flo cartridge which is a laminated block about 1½" thick through which at spaced intervals are stretched 20 layers of RAPID FLO long fibred cotton. The RAPID FLO FILTER can be used for vinegar, cider, fruit juices, extracts, alcohol, chemicals, oils and other liquids. We carry a full line of Filter paper. Also Hose for all purposes. Send us a sample of your needs.

CONSOLIDATED SIPHON SUPPLY CO., INC.
Dept. F, 22-24 Wooster Street New York City

MERCOID
AUTOMATIC CONTROLS

FOR REFRIGERATION AND VARIOUS FOOD PROCESSING APPLICATIONS

Mercoid DA Pressure or Temperature Controls for direct or remote mounting, have the outside double adjustment feature, which greatly simplifies setting the operating range, plainly indicated on a visible dial.

Mercoid Liquid Level and Float Controls available for various applications.

Mercury switches used exclusively in all Mercoid Controls, thereby assuring better control performance and longer control life.

Catalog sent upon request

DA Controls for Temperature or Pressure

Liquid Level, Low Water and Boiler Feed Water Pump Controls

Float Control

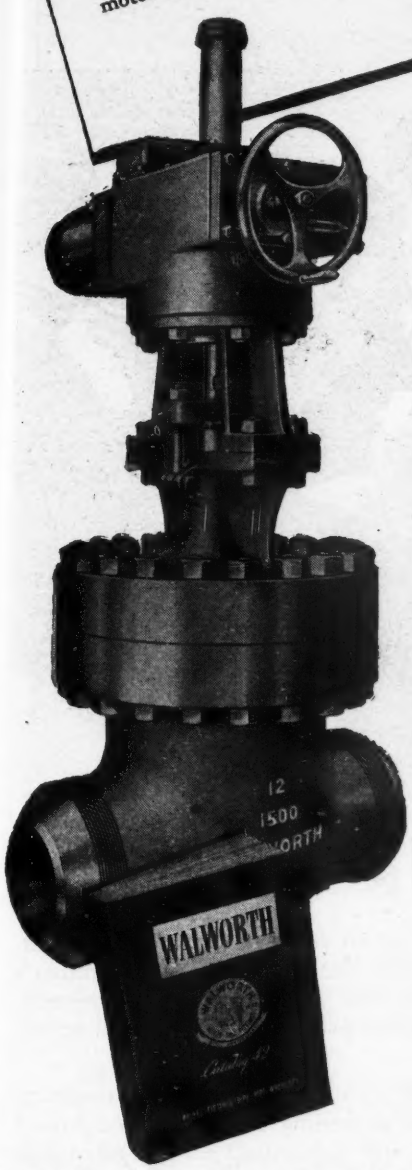
THE MERCOID CORPORATION, 4203 W. BELMONT AVE., CHICAGO 41, ILL.

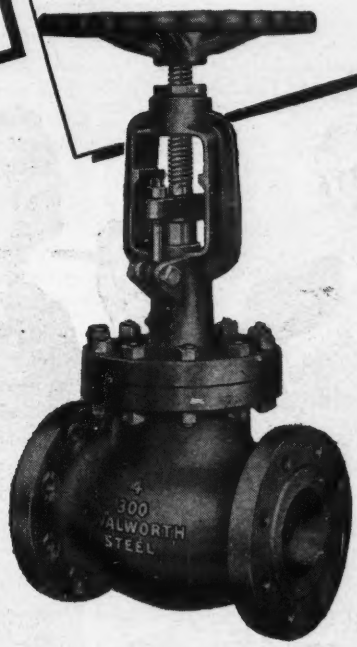
FIT THE VALVE TO THE SERVICE

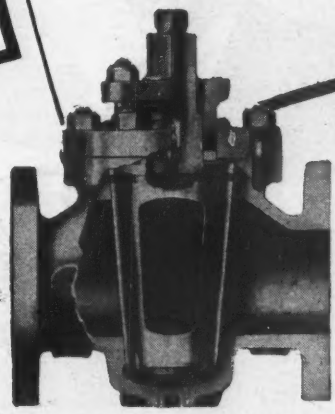
WALWORTH STEEL GATE VALVES can be furnished with welding ends, screwed ends, or flanged ends. Sizes from 2" to 24" inclusive. For hand operation, air or gas motor operation, or electric motor operation.

WALWORTH STEEL GLOBE VALVES can be furnished with welding ends, screwed ends, or flanged ends. Sizes from 2" to 8" inclusive. For hand operation, air or gas motor operation, or electric motor operation.

WALWORTH LUBRICATED PLUG VALVES are made in sizes from ½" to 24" inclusive, for pressures from vacuum to 5000 psi.







YOU CAN CHOOSE A WALWORTH *Steel* VALVE

engineered to your particular service

Be sure that every valve fits the service for which it is selected – and fits exactly. In the Walworth line there's a type for every job, engineered so as to assure maximum economy and worry-free performance. Each Walworth Valve has all the characteristics required for its special service.

For instance, Walworth makes a complete line of cast steel valves. They can be furnished in both gate and globe types with welding ends, screwed ends, or flanged ends. Heavy walls give enduring strength. Deep stuffing boxes eliminate troublesome leakage. Streamlined ports decrease pressure drop. These Walworth Valves have what it takes in every detail of design, metallurgy, and construction to lick your toughest jobs.

For the "difficult" fluids the answer is often found in a Walworth Lubricated Plug Valve. It opens or closes with but one-quarter turn of the valve handle, and a positive tight shut-off is assured. It's easy to operate and remains completely sealed against leakage in both the open and closed positions.

For economy's sake, be sure to "fit the valve to the service."

To help you "fit the valve to the service" you'll find pertinent information on Walworth's complete line of valves, fittings, pipe, and pipe wrenches in the new Walworth Catalog 42. Included are 78 pages of practical engineering data that simplify valve selection and make piping layouts easier. Write, on business stationery, for your free copy. Address: Walworth Company, 60 East 42nd Street, New York, N. Y. Department D-2.

ARMY E ARMY E NAVY

BOSTON WORKS
KEWANEE WORKS

WALWORTH
valves AND fittings

WALWORTH ★ VALVES AND FITTINGS ★ ESTABLISHED 1842

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

. . . and drive even harder on the pay-roll savings plan!"

Make War Bonds the Christmas Order of the Day. Urge your workers to make their personal Christmas gifts in the form of War Bonds—and practice what you preach! Make this a 100% War Bond Christmas—to insure future Yuletides of peace and prosperity.

Make up your own posters to spread the "War Bonds for Christmas" story across your plant. Tell the story again and again on bulletin boards, in your plant magazine, and on pay envelope stuffers.

But don't forget your basic, all-important Pay-Roll Savings Plan. How's it going, these days? Perhaps it needs a bit of stoking-up right this very minute, to hold its full head of steam against the competitive demands of the holiday season.

Well, you're the man to stoke it! You can't expect it to keep running indefinitely on last summer's enthusiasm. See to it that your participation percentages, and your deduction percentages, *both* end up the year at new levels.

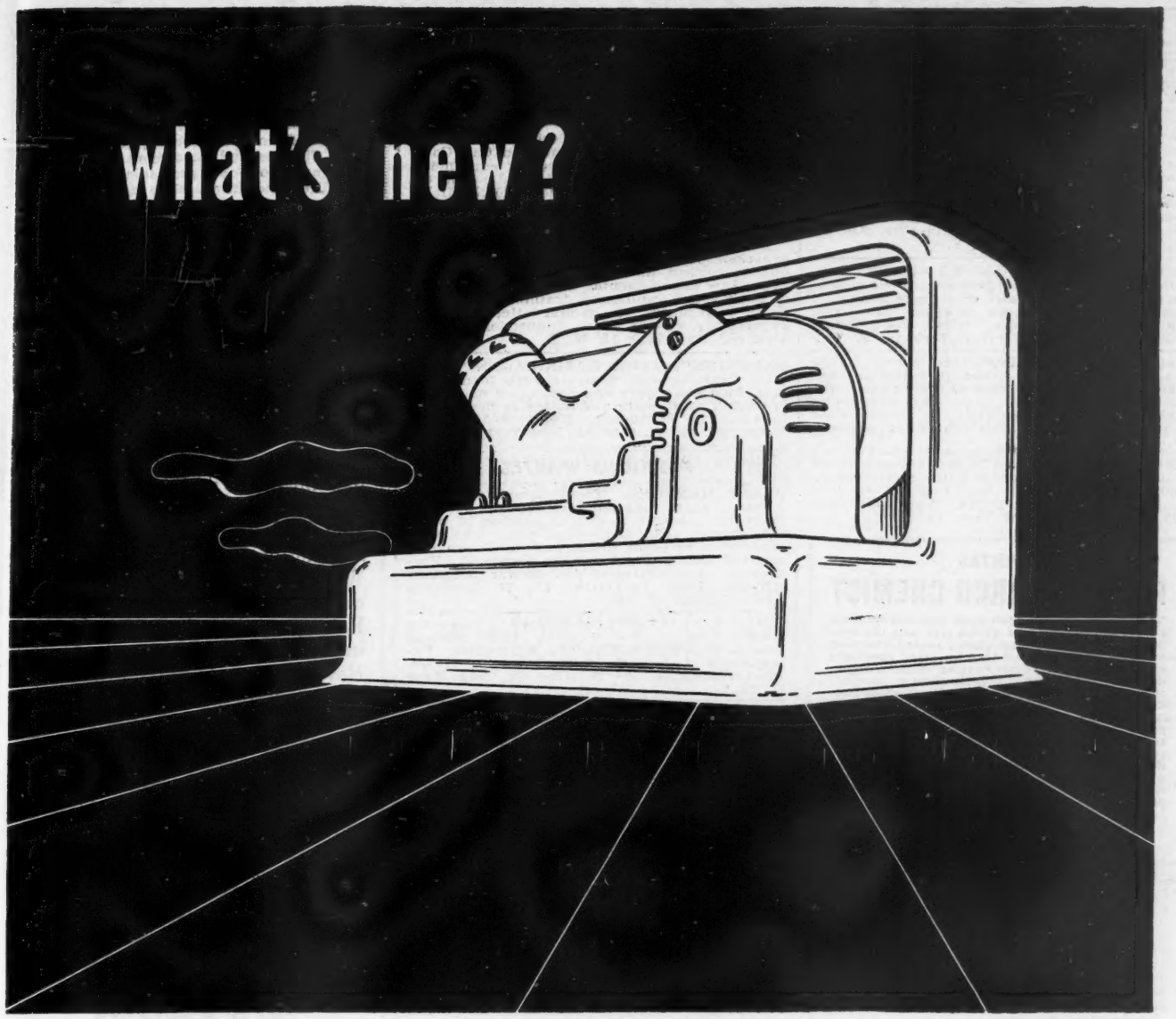
Every month, now your Pay-Roll Savings ought to run well ahead of the preceding month. *For so many families that formerly depended on the earnings of a single worker, now enjoy the combined earnings of several.* Such *family* incomes are doubled, trebled, even multiplied many times.

Now's the time to turn as much as possible of these increased earnings into War Bonds—War Bonds for Christmas . . . and War Bonds the whole year 'round!

GIVE THE PRESENT WITH A FUTURE—WAR BONDS!

This space contributed to Victory by **FOOD INDUSTRIES**

This advertisement prepared under the auspices of the United States Treasury Department and the War Advertising Council



"LET'S ASK UNIVERSAL COOLER"

Plans outlining "What's New?" in refrigerating units already have advanced beyond the drawing board. At Universal Cooler, these plans reveal . . .

- sound design-engineering based on nearly a quarter century of pre-war leadership.
- extra unit ruggedness and efficiency as a result of meeting wartime demands.
- practical vision to help you achieve your post-war refrigeration equipment objectives.

WRITE TODAY!

Our expanded research-engineering department is prepared to handle your inquiry regarding . . . Frozen Food Cabinets • Food Storage Refrigerators and Display Cases • Ice Cream Cabinets • Water and/or Beverage Coolers • Commercial Refrigeration Equipment • Air Conditioning • Machine Tool Cooling • Other Applications You're Planning.

UNIVERSAL COOLER

WE SELL TO MANUFACTURERS ONLY

UNIVERSAL COOLER CORPORATION • *Automatic Refrigeration since 1922*

MARION, OHIO • BRANTFORD, ONTARIO

POSITIONS VACANT

SUPERINTENDENT: Well established food plant affords excellent opportunities for an aggressive man with knowledge of fruit packing. Permanent position, excellent salary. State age, draft status, experience in detail first letter. P-187, Food Industries, 330 W. 42nd St., New York 18, N. Y.

MAINTENANCE FOREMAN: With detailed experience on fruit canning equipment. Eastern Food manufacturer offers permanent position with wonderful salary opportunities. In first letter give age, list of previous employers, draft status. P-188, Food Industries, 330 W. 42nd St., New York 18, N. Y.

CHEMIST OR CHEMICAL ENGINEER. Beverage experience very desirable. Food manufacturing also helpful. Good position, good wages. Post war future excellent. Give age, training and experience. P-235, Food Industries, 330 W. 42nd St., New York 18, N. Y.

PACKAGING ENGINEER, experienced on high speed wrapping machines to maintain continuous production on gum wrapping machines. Excellent opportunity. State age, experience, and salary desired. Write to P-236, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

CHEMIST—Experienced in production of fruit juices, fruit juice concentrates, fruit extracts and related products. Inquiries will be held in strict confidence. P-237, Food Industries, 330 W. 42nd St., New York 18, N. Y.

WANTED

FOOD RESEARCH CHEMIST

Opportunity for an experienced food chemist and quality control man. We want a man with the ability to develop and control quality canned meat food products, who has had at least ten years' experience in the meat food products canning industry. Splendid opportunity for man capable of taking complete charge of our research department and whose ability commands a substantial salary. This opportunity is offered by a large, well established meat food products canner who has national distribution and acceptance for their famous trade-mark, and who is presently heavily engaged in the production of Army Rations, as well as civilian food products. The position we want to fill is a permanent one for the right man who can manage and control our research department. Write full particulars to

P-240, Food Industries
330 W. 42nd St., New York 18, N. Y.

WANTED

SKILLED ENGINEERS

Engineers with an eye to the future are needed by a leading soya bean processing plant engaged in vital war work and having a substantial post-war product development program.

Men trained by virtue of education and/or experience are required for building design, mechanical design, material handling and equipment layout.

In answering, give complete information regarding educational background, age, family and draft status, experience and present type of work. Also enclose a recent snapshot if possible.

P-244, Food Industries
520 N. Michigan Ave., Chicago 11, Ill.

WANTED

MECHANICAL ENGINEER

Food or chemical plant experience. State age, experience, salary. Statement availability required.

P-233, Food Industries
330 W. 42nd St., New York 18, N. Y.

WANTED

CHEF

For experimental work with experience in soups and poultry products in canning industry. State experience, former employers, salary, full particulars, how soon available and personal data in first letter.

P-227, Food Industries
330 W. 42nd St., New York 18, N. Y.

WANTED

Experienced Purchasing Agent

For fast-growing manufacturer of basic food specialties. Opportunity particularly attractive because of Company's post-war expansion plans. Write in strict confidence giving us complete personal details and business record (with earnings). Must be draft-deferred. Our own men know of this ad.

P-228, Food Industries
330 W. 42nd St., New York 18, N. Y.

POSITIONS VACANT

FACTORY SUPERINTENDENT WANTED. Long established and expanding company has an opening for an aggressive man in vegetable canning. P-229, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

FOREMAN WANTED for closing machine department. Must know American Can Company machines, also can-handling equipment. Ability to organize work and handle help essential. P-230. Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

FOOD CHEMIST to take charge of laboratory in large Baltimore canning plant. Must be experienced in commercial canning technique, quality control, and must know all Food and Drug Law requirements. Give full particulars of background, education, training, salary desired, draft status, etc. in first letter. Splendid opportunity. P-238, Food Industries, 330 W. 42nd St., New York 18, N. Y.

EXPERIENCED PURCHASING AGENT Wanted, draft exempt, familiar with food products, food machinery and packaging materials. State full particulars and salary in first letter. Location in Pittsburgh, Penn. P-245, Food Industries, 330 W. 42nd St., New York 18, N. Y.

POSITIONS WANTED

PLANT MANAGER. Food chemist with seventeen years experience in control, development and research is seeking position of plant manager in food processing firm. One year experience in plant management. Capable of meeting people and handling personnel. Progressive firm interested in postwar program. PW-239, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

FOOD SPECIALIST experienced. Preparing own formula for Pickled Fish, various Sauces, Dehydrated Fish and Vegetables. Experimental Laboratory work desired. PW-234, Food Industries, 330 W. 42nd St., New York 18, N. Y.

FORMER VICE PRESIDENT, Manager and Buyer of Wholesale Grocery Companies desires position as Food Executive. 13 years wholesale, 5 years retail owner. State salary and particulars. Age 40, draft exempt. H. T. Preddy, 1443 Willard St., San Francisco 17, Calif. Phone Montrose 9392.

FOOD CHEMIST: B. S. Chemistry and Physics. Graduate training organic chemistry, organic qualitative and quantitative analysis. Practical knowledge of bacteriology and mycology. Twelve years experience, dairy products, fermentation, protein hydrolysis, sodium gluamate. U. S. Citizen, 40 years old, married, have one child. Draft Status 3-A(H). Available on reasonable notice. PW-246, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

DAIRY TECHNOLOGIST: College graduate. Seven years experience in formulation and production of process cheese, hot pack cream cheese, blue cheese, and other dairy products. Thorough knowledge of dairy bacteriology and mycology. Citizen, 40 years old, married. Draft status 3A(H). Available on short notice. PW-247, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

FOR SALE

FOR SALE — Complete Refrigeration Plant Remington Ammonia Compressor, Condenser, etc. 25 HP Elec. Motor, Starter Switch, Elec. Wiring, etc., Storage Box Doors, 350 ft. Tract, Hangers, Meat Hooks, Line Shaft, Pulleys, Belts, etc. D. L. Snyder, 131 W. Pratt St., Baltimore, Md.

FOR SALE—Ten and Twenty Quart heavy metal Ice Cream Cans, good usable condition, branded, any quantity. Can be used for many purposes. Black & White Corporation, 574 West 130th St., New York 27, N. Y.

FOR SALE—2—Krupp—Moodag—75 HP 500 RPM 3 Cylinder Diesel Engines with 'V' belt drives. Can be seen in operation. In perfect mechanical condition. Low price. Black & White Corp., 574 West 130th St., New York 27, N. Y.

FOR SALE—Torsion Scales, Black Glass Table Tops, 24" Exhaust Fan, Paper Baler, Servis Recorders, 1½" tin copper Pipe, 15 Gallon Steam Kettle, Electric Mixer, Oscillating Fans, Kelvinator Low Temperature Cabinets, 8 Burner Gas Range, Thermos Containers. Black & White Corporation, 574 W. 130th St., New York 27, N. Y.

FOR SALE—Egg drying plant—new—never operated. FS-242, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

WANTED

WANTED—Two 500 HP Tube boilers. Send full particulars and price loaded on car. W-241, Food Industries, 520 N. Michigan Ave., Chicago 11. Ill.

WANTED—Used Mustard Grinding Mill, prefer Premier or Eppenbach vertical type. Large size grinding wheels as volume production is desired. W-226. Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

EXPERIENCED

SALES REPRESENTATION

New York City, Northern New Jersey and Western Connecticut territory (vicinity New York City) desired for commission sale of machinery to Food processing Chemical and Drug Industries. Wide acquaintance; know manufacturing processes and engineering sales from successful representation of standard and special engineered machines and equipment. Confidential correspondence with manufacturers. Address

RA-231, Food Industries
330 W. 42nd St., New York 18, N. Y.

FOODS

With a view to post-war development large English firm of Food manufacturers with surplus capital and manufacturing facilities available is desirous of entering into negotiations with American firm. Would be prepared to purchase outright suitable Trade Mark or Patent, or enter into manufacturing arrangements on royalty basis. Have connections throughout Great Britain with Grocers, Bakers and allied trades. Replies treated strictly confidential.

Box 200 C/o T. B. Browne, Ltd.
551 Fifth Avenue New York City

WRAPPING MACHINES WANTED

Package Model C for wrapping 5¢ chocolate bars.

Reply to W-224, Food Industries
330 W. 42nd St., New York 18, N. Y.

WANTED

2—Tablet Machines: 3—Filters.

2—Dry Powder Mixers, with or without Sifters.

2—Rotex Screens; 1—Packaging Machine; 1—Glass Lined Kettle; Stainless Steel, Monel, Copper or Aluminum Jacketed Kettle and Vacuum Pan.

W-132, Food Industries, 330 W. 42nd St., N. Y. C.

WANTED

FERRY POTATO-CHIP MACHINES

We are desirous of buying one or more J. D. Ferry continuous potato-chip machines. State type—condition and price.

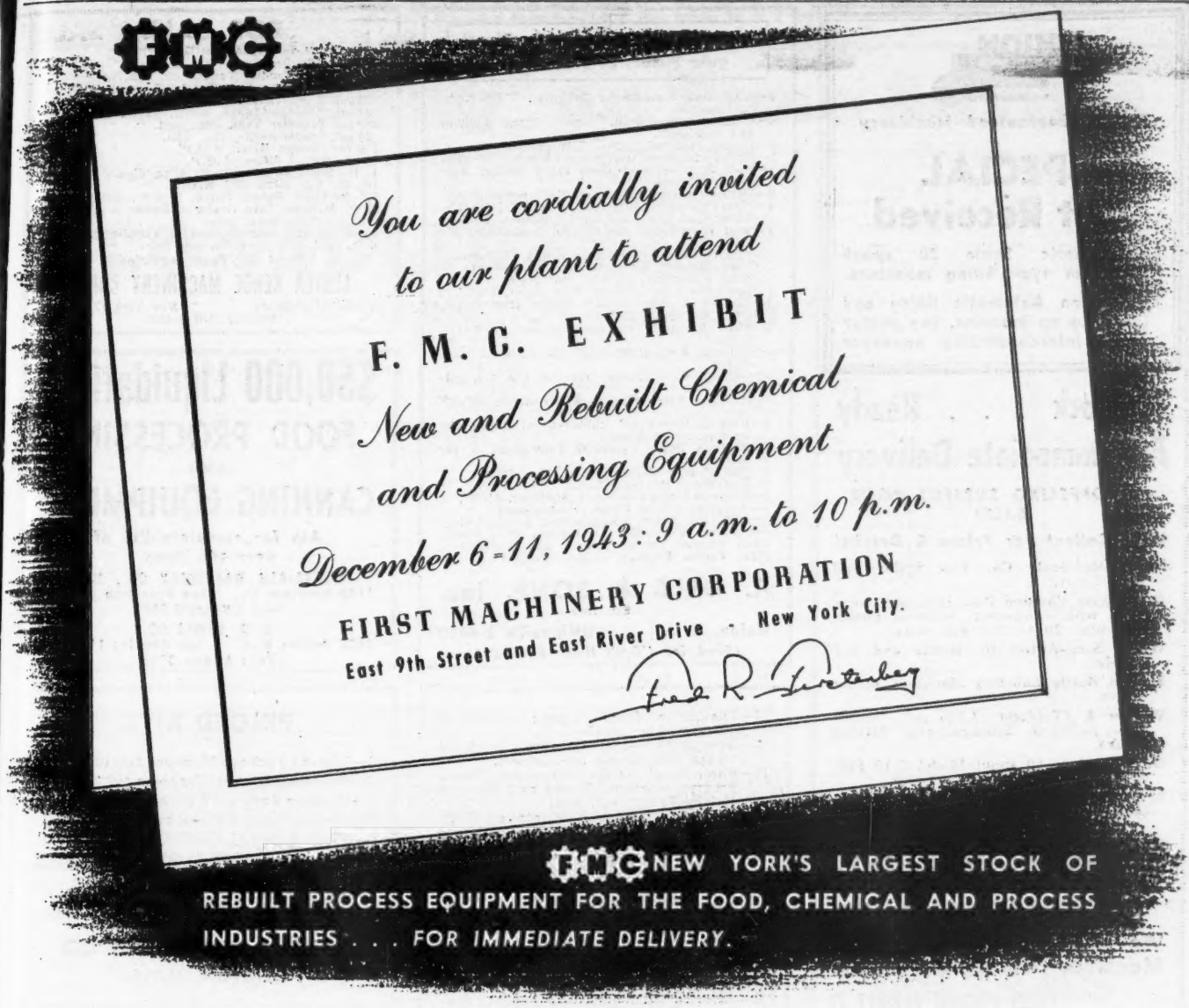
W-232, Food Industries
330 W. 42nd St., New York 18, N. Y.

WANTED

FOOD PRODUCTS

We will buy available dried mushrooms, dehydrated onions, sweet red peppers, and sweet potato flour. State quantity and price.

International Foodcraft Corp.
63 Whipple St. Brooklyn 6, N. Y.


F M C
You are cordially invited
to our plant to attend
F. M. C. EXHIBIT
New and Rebuilt Chemical
and Processing Equipment
December 6-11, 1943: 9 a.m. to 10 p.m.
FIRST MACHINERY CORPORATION
East 9th Street and East River Drive - New York City.
F M C NEW YORK'S LARGEST STOCK OF
REBUILT PROCESS EQUIPMENT FOR THE FOOD, CHEMICAL AND PROCESS
INDUSTRIES . . . FOR IMMEDIATE DELIVERY.

AGITATORS
BLOWERS
BOTTLE & JAR
Cleaners, Rinsers
Sterilizers
CAPPERS
CAN CLOSERS & SEAMERS
COLLOID MILLS
CONVEYORS
COOKERS
CRUSHERS
CRYSTALLIZERS
CUTTERS
DICERS
DISINTEGRATORS
DRYERS
DEHYDRATING EQUIPMENT
EMULSIFIERS
EVAPORATORS
EXTRACTORS
FILLING EQUIPMENT
Liquid, Semi-Liquid
Paste, Dry Materials
FILTERS
FOOD CHOPPERS & GRINDERS
HOMOGENIZERS
HYDRAULIC PRESSES
HYDRAULIC LIFTS, TRUCKS
KETTLES—Aluminum
Copper, Glass Lined
Iron, Cast Iron
Monel, Nickel
Stainless, Sheet Steel
LABELERS
MIXERS (Dry)
Powder, Semi-Liquid
Heavy Duty, Paste
Jacketed
PACKAGING EQUIPMENT
PANS—Evaporating
Coating, Vacuum
PERCOLATORS
PORTABLE MIXERS
PRESSES—Hydraulic
Tablet, Toggle
PUMPS—Gear
Rotary, Vacuum
Centrifugal
RETORTS—Pasteurizers
SIFTERS & MIXERS
STILLS
TANKS

FIRST to "really rebuild" EQUIPMENT to FUNCTION good as new!

Call GRamercy 7-6620
Cab service provided
to our plant

F M C FIRST MACHINERY CORP.
EAST 9TH STREET & EAST RIVER DRIVE, NEW YORK

UNION
Established 1912
Rebuilt Guaranteed Machinery

SPECIAL
Just Received

1—Pneumatic Scale 20 spout vacuum type filling machines.

1—Johnson Automatic lining and setting up machine, top sealer and interconnecting conveyor

In Stock . . . Ready For Immediate Delivery

ALL OFFERING SUBJECT PRIOR SALE!

Wire Collect For Prices & Details!

Pneumatic Scale Co. Top Sealer and Wax Liner.

48" Copper Vacuum Pan, jacketed, complete with condenser, vacuum pump, etc., also 20 to 300 gal. sizes.

World Semi-Automatic Bottle and Jar Labeler.

Ermold Bottle Labeling Machines, motor driven.

Werner & Pfleiderer, 2,500 gal., double arm jacketed Storage and Mixing Tanks.

U. S. Bottlers 10 spout Model C-10 Filling Machine, 4 to 16 oz. cap.

850 gal. capacity Steam Jacketed Single Action Vertical Mixing Tank.

PACKAGING AND CARTONING EQUIPMENT

Including cartoning units, filling and wrapping machines—all types, makes and sizes in stock.

We Pay Cash For Single Machines Or Entire Plants

EVERY MACHINE REBUILT TO UNION'S STANDARD OF PERFECTION

UNION STANDARD EQUIPMENT CO.

318-22 LAFAYETTE STREET
NEW YORK, N. Y.

1—Zahn & Nagel 60 bbls. Kieselguhr Filter, 24", 14 leaves.

2—Aluminum Condensers, 36" dia., 6'10" high, no tubes.
1—Copper Jacketed Still, 50-gals., Copper Column and Condenser.
1—Copper Jacketed Kettle, 3750-gals.
1—Closed Aluminum Oval-Shaped Kettle, 2300-gals.
1—Cast Iron Jacketed Glass-Lined Kettle, Agitated, 250-gals.
2—Devine Jacketed Autoclaves, 3'x4', bolted covers.
2—Steel Unjacketed Autoclaves, Agitated, 1000-gals.
1—Valley Cast Iron Unjacketed Autoclave, 60-gals.
1—Acid Brick-Lined Steel Tank, Agitated, 2650-gals.
1—Steam Jacketed, Stay-Bolted Tank, 8000-gals.
7—Dopp Jacketed Kettles, 80-gals. to 300-gals.
1—Steel Vulcanizer, 8½'x10', ½" plate.
1—Louisville Rotary Steam Tube Dryer, 6'x50'.
1—Bartlett & Snow Rotary Direct Heat Dryer, Brick-Lined, 8½'x50'.
3—Steel Pressure Degreasing Ovens, 7x7½x15'; 9x8x15'.
1—DeLaval #900 Centrifugal Oil Purifier, pulley driven.
1—DeLaval #300 Multiple Gasoline Clarifier, pulley driven.
1—Stainless Steel Washer & Extractor, 36"x18" deep.
4—King & Gerber 48" Rubber-Lined Basket Extractors, motor driven.
6—Sharples Super Pressurite Centrifuges, 3 HP Motors.
3—Day Powder Mixers, 100#, 200#, 500#
1—Day Rotex Powder Sifter.
1—Kenyoun-Francis Jacketed Sterilizer, 5'x10'.
1—American 3-Leaf Filter, wooden leaves.
3—INFILCO Filters, stainless steel & monel discs.
3—Johnson Hydraulic Filter Presses, 18", 7 Plates.
Also: Storage Tanks, Pumps, Air Compressors, Pipe, Valves, Fittings, Boilers, Evaporators, etc.

R. GELB & SONS, Inc.
Est. 1886
Union, N. J. UNionville 2-4900
(Send for "Gelb News Record").

FOR SALE

24 Valve Meyer syphon bottle filler.
60 gal. Pfaudler Tank, jkt., rev. coil.
4—100 gal. Pfaudler Tanks, jkt., agit.
300 gal. Nickel Tanks, 36"x60"x36", insul.
300 gal. S. S. Tank, jkt., agit.
300 gal. Pfaudler Tanks, horiz., 42x48, insul.
330 gal. Pfaudler Tank, jkt., agit.
25 gal. Copper Kettle, jkt., agit.
1½ bbl. Dough Mixer, 3 H.P.
80 qt. Hobart Mixer, 2 H.P.
J. H. Day Post Mixers, S. S. paddles.
100 lb. Day Sifter and Mixer.
¾" Northern Rotary Pump, 3 H.P., 300# press.
12 ft. Multiple Tube Heater or Cooler, 8 p.h. with 32 1" white metal tubes.
60 to 400 gal. Homogenizers or Viscolizers.
6 ft. & 7 ft. Copper Vacuum Pans.

Send Us Your Inquiries

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street New York 17, N. Y.
MUrray Hill 2-4616

$50,000 Liquidation!
FOOD PROCESSING
AND
CANNING EQUIPMENT

Ask for complete list of over 400 items.

HORNE-ASH MACHINERY CO., INC.
1188 Harrison St., San Francisco 3, Cal.
Tel.: UNderhill 5571

D. B. LEWIS CO.
3402 Avalon Blvd. Los Angeles 11, Cal.
Tel.: ADams 3303

4—Pneumatic Scale Duplex Automatic Straight Line Labelers.
6—New 60 gal.—1,000 gal. Stainless Steel Tanks with Stands and Covers.
18—New Wood Tanks (Cypress) Closed Pressure Storage, Round and Tapered 19,220—22,630 gal. cap.
1—Frick, 3 Cylinder Refrigerating Compressor with 3 HP, Single Phase Motor.
15—Storage Steel Tanks, Welded and Sectional, Gray and Black, Glass-Lined, 1550—11,470 gal. cap.
9—J. H. Day Horizontal Tilting Type Mixers.
1—C. P. Mfg. Stainless Steel Pasteurizer, 100 gal. cap. rectangular 45x20x32, with Stainless Steel Agitator.
40—100 gal. Galvanized Spice Hoppers, on Casters, with discharge Valves.
3—Attrition Mills (Robinson & Sprout Waldron), 2—10 HP and two 2—15 HP Motors.

Also Condensers, Columns, Double Pipe Coolers and Centrifugal Pumps

Write for latest Stock List

PERRY EQUIPMENT & SUPPLY CO.
1515 W. Thompson St., Philadelphia 21, Pa.

PRICED RITE

1—Johnson Package Wrapper 2x4x10"
2—Hayssen Package Wrappers 4x7"
1—Hayssen Package Wrapper 7x17"
10—Puffing Guns—Wheat or Rice
1—BROWN DUVAL MOISTURE TESTER
3000—METAL TRAYS 24x30" Perforated
1—Standard-KNAPP CASE SEALER
4—ROTARY TYPE BRICK FERRIS OVENS
Lot BALL BEARING ROLLER CONVEYORS.

VAN BRODE MILLING CO.
CLINTON, MASS.

DE LA VERGNE DIESEL SET

One 4 cyl. 4 cy. 17x24, solid injection 400 HP, 330 KVA, 3/60/2300, Type SI, Mod. VA, 225 RPM, dir. con. exciter, control panel, complete auxiliaries. A standby, hardly ever been run, condition perfect and good as new, can be inspected in operation. Wire or phone,

ILLINGWORTH ENGINEERING CO.
Jacksonville 2, Fla.

FOR SALE

3—Lard Rolls, 3x6, 4x9 and 2x5'.
2—4x6' Atmospheric Drum Dryers.
2—Vacuum Drum Dryers, 48x40 & 40x60".
6—#600 DeLaval Clarifiers.
6—World & National semi-auto. Labelers.
2—Rotary Bottle Rinsing Machines.
1—Huhn Grain Dryer 3x12'.
1—#6 style B Peerless rotary Exhauster.
1—24" Attrition Mill with 20 hp. motors.
1—100 sq. ft. single effect Evaporator.
2—Colloid Mills requiring 40 hp. each.
Dough and Powder Mixers, Bottle and Can Fillers, Filters, Filter Presses, Mills, Dryers, Pumps, Boilers.

Send us your inquiries, also your list of surplus equipment, which we purchase for cash.

LOEB EQUIPMENT SUPPLY CO.
908 N. Marshfield Ave. Chicago 22, Ill.

BUFFALO 24" x 20" Vacuum Drum Dryer

Glass Lined 500 Gal. Closed Kettle, Jacketed

Two Glass Lined 50 gal. jacketed closed kettles

KIEFER 20' Belt Compression Unit

Copper Jacketed Kettles, 5 to 50 gals.

Copper Jacketed Kettle, 400 and 600 gals.

Nickel Jacketed Kettle, 100 gal.

Four New ¾ HP AC Portable Agitators

7", 12" and 18" Filter Presses.

We buy single items to complete plants

MACHINERY & EQUIPMENT CORPORATION (of N. Y.)
59 E. 4 St., New York 3, N. Y.

FOR SALE

Battle Creek CLC Carton Wrapper, Pirtle Comb. Nut Fryer and Cooler, #1½ Sirocco Exhaust Blower, all new. Triumph 16bl. Noodle Mixer. Bakers Supply Motor Driven Noodle Cutter. 10 Toledo 1 lb. Scales.

TIP TOP CO.
TROY, OHIO

! AMERICAN DISTILLERS !

Offer Quality Liquors, Rum, Gin, Cuban Whiskeys, Cordials, Vermouths.
Liquors Distillers Exporters Specialists
Box 2105, Havana, Cuba.

FOR SALE

One Continuous Potato Peeling Machine, a product of Food Machinery Corporation, in use less than one year.
FIVE HUNDRED (500) galvanized Self-Stacking Trays with wooden frames, 34½" x 51", in use about six months.

FS-248, Food Industries
330 W. 42nd St., New York 18, N. Y.

No "Ceiling" on Time Saving

When you buy

BUY VICTORY BONDS

"CONSOLIDATED"

WAR PRODUCTION MACHINERY

10—Pony Mixers 8 to 80 gal. capacity.
15—Dry Powder Mixers, from 50 to 4000 lbs.
13—Edbauer, Scott, U. S. auto. Weighers and Fillers.
2—80-qt. Century 4-speed Mixers, m.d.
2—Horizontal Steam Jacketed Mixers, 1100 gal. each
14—Double and Single arm Mixers, jacketed and unjacketed, up to 500 gal. cap.
1—32"x72" Buffalo Atmospheric double drum Dryer, complete, m.d.
1—C.C. & S. 7-head Jumbo Model "B" Crowner, m.d.
1—Pneumatic Scale 6-head auto. Screw Capper and Feeder, complete, m.d.
2—Buffalo 24" Vanilla Bean Choppers.
2—World, 1—Ermold semi-auto. Labeling Machines.
1—Burt Straight Line Duplex Labeler.
1—Karl Kiefer Visco Filling Machine.
1—#7 Sweetland filter, 27 copper leaves, 3" c.c.
6—Filter Press P & F; Recessed; to 42" Square.
1—Pneumatic Scale Slip On Can Capping Machine, complete with conveyors, m.d.
1—World Rotary Automatic Labeling Machine.
2—Aluminum jack, Agit. Stills, 275 gal. and 350 gal.
8—DeLaval and Sharples Super Centrifuges.
2—Mechanical 4x9' Lard Rolls, m.d.
17—Copper, Glass Lined, Kettles and Vacuum Pans, up to 550 gal. capacity.
3—#432 Rotex Sifters, triple deck 40"x84", complete, m.d.
2—Schutz-O'Neil Pulverizers.
3—K.K. & U.S. Rotary bottle Rinsers, m.d.
1—5x35' Louisville Steam Tube Dryer.
1—Elgin 12-spout Rotary Piston Filler, S.S.
12—Copper Tanks to 7000 gal.
1—Johnson T & B Sealer Unit.
2—2"x2" Bronze Rotary Pumps, m.d.
1—U.S. Brightwood Box Machine.

★ • *Send for "Consolidated News" listing complete stock.* ★

We buy and sell from a Single Item to a Complete Plant

CONSOLIDATED PRODUCTS CO., Inc.

Office: 13-17 PARK ROW, N. Y. Shops: 335 DOREMUS AVE., NEWARK

Buy With Confidence — "Consolidated"

LIQUIDATION

MACHINERY AND EQUIPMENT OF FOOD PRODUCTS PLANT INCLUDING PILOT PLANT

1—BUFFALO LABORATORY DOUBLE DRUM DRYER, vacuum type, with two stainless steel rolls, 6" diameter x 7¾" face. Complete in every detail.
1—BUFFALO 60 gallon stainless steel steam jacketed VACUUM PAN, with condenser, vacuum pump. Complete in every detail.
1—ELLIS No. 2, type A ROTARY DRYER, 20" diameter.
1—ELLIS No. 2, type A ROTARY COOLER, 20" diameter.
1—16" ELLIS ROTARY DRYER, type X.
1—J.P. DEVINE 40" x 60" single drum ROTARY VACUUM DRYER, with new iron drum complete.
1—BLACKMER ROTARY PUMP, with 1¼ HP, 3 p., 60 c., 440 v. motor, new.
1—BUFFALO steam driven VACUUM PUMP, 8" x 8" x 12".
1—ANDERSON, No. 1 OIL EXPELLER, with 6" diameter x 10' long pressure heater conveyor (tempering apparatus) and Gump Feeder. Recently completely reconditioned.
1—SHARPLES CENTRIFUGE with block tin bowl, motor driven with AC motor, complete.
1—Union Steam Pump Company, No. 100 VISCOLIZER, chain motor driven to 5 HP, AC motor, including bronze head, recently installed.
1—BUFFALO single drum ROTARY VACUUM DRYER, 48" diameter x 40" face.
1—12" x 12" DEVINE VACUUM PUMP, with 15 HP 3 p., 60 c., 440 v. motor.
1—J. P. DEVINE 400 sq. ft. SURFACE CONDENSER.

All of the above equipment is now set up and can be seen in operation. Each unit is complete with accessory fittings.

★ Selected Buys from the West Coast

A-B Cooker & Cooler for #10 cans, Cooker 400 cans, Cooler 100 cans.
A-B Cooker & Cooler for #2½ cans, Cooker 832 cans, Cooler 260 cans.
Berger & Carter Cooker & Cooler for #2½, Cooker 1008 cans. Cooler 280 cans.
6—Draper type conveyors, 6"-24" wide, 6'-20' long.
Worthington Steam Pump 10 x 6 x 10.
Merry-Go-Round Conveyor, 50 pans.
2—Hoepner Automatic Scales for dry products, auger and scale types.
2—100 gal. Krenz Copper Vacuum Pans.
Charlotte Colloid Mills, Stainless Steel.
Eppenbach Colloid Mill, Stainless Steel, 3 HP.
U.S. Piston Type Filler, for jam, etc.
Jay Bee Cracker Jack Hammer Mill.

For Dependability with Economy

MEEO MACHINERY AND EQUIPMENT CO.

732 BRYANT STREET • SAN FRANCISCO • CALIF.

FOR SALE

DRYERS

1—Buflovak Double Drum Dryer, 32" x 90", atmospheric, with all accessories, EXCELLENT CONDITION
1—Buflovak Vacuum Drum Dryer, 24" x 20", single drum
2—Devine Vacuum Shelf Dryers, with 13—59" x 78" shelves
1—Buflovak Vacuum Shelf Dryer, with 12—42" x 42" shelves
1—Buflovak 5' x 6' Single Atmospheric Drum Dryer
1—Devine 4'3" x 19'8" Steam Tube Dryer
3—Rotary Vacuum Dryers, 2½' x 10', 3' x 8', 5' x 10'
1—6' Single Apron Conveyor Dryer, 60' long
2—Pfaudler 300 gal. Tanks
1—Pfaudler 300 gal. Jacketed Tank
1—Pfaudler 125 gal. Vacuum Pan
3—Sharples No. 6 Centrifuges
1—Shriver 30" x 30" Filter Press
1—Copper Vacuum Pan, 30"
10—Centrifugals, 20" to 48" dias. baskets
7—Vibrating Screens, Rotex Tyler

Complete stocks of Pulverizers, Mixers, Conveyors, Pumps, Filters, Tanks, Kettles, etc. Send for bulletins.

BRILL Equipment Co.

183 VARICK STREET NEW YORK

Zone 14

FOR SALE

"Battle Creek" bread slicing & wrapping machine, Model #21, Serial #9617. Century One Barrel Dough Mixer.

We also buy used equipment

AMERICAN SALES COMPANY

1562 Harrison Ave., Cincinnati, Ohio

Davidson Wet Vacuum Pump 3½ x 4 x 4.
Several used Copper Steam Jacketed Kettles.
3 HP Elec. Motor D.C. 575 rpm perfect.
One 10 HP Kane gas fired steam boiler almost new.

THOMAS BURKHARD, Inc.

494-496 Flushing Ave., Brooklyn, N. Y.

TANKS from Tank Cars

Large quantity

8,000-gallon 10,000-gallon

Built for 60# Hydrostatic and 25# Air Tests.

CLEANED—TESTED—PAINTED

Special Notice: **What would *PORTABLE* storage of your Liquids save you? Ask our proposition on *WHOLE CARS!***

Also TANKS, Commercial, Vertical and Horizontal

From 2879 to 12,500 gals. and even much larger.

IRON & STEEL PRODUCTS, INC.

38 years' experience

13426A S. Brainard Ave., Chicago 33, Illinois

***"ANYTHING* containing IRON or STEEL"**

FOR SALE

Triangle Model "U" Bag Filler.
Hayssen Cellophane Box Wrapper.
Schutz O'Neill Dustless Sugar Pulverizer No. 3, No. 0 and 16" Limited.
24" Pebble Mill, belt drive.
1 ton York, 1 ton Lipman 3 ton Frick, 5 ton Jurick and 7½ ton Lipman Self-contained Refrigeration Units.
Steam Jacketed Copper Kettles, 15 gallon to 350 gallon capacity.
Dean Glucose Pump Steam Driven.
Tabor 3" Glucose Pump, motor driven.
Read 80 qt., Hobart 80 qt., Century 30 qt., and Read 12 qt. Vertical Mixers.

SAVAGE BROS. CO.

2638-46 Gladys Avenue Chicago

THERE'S A NEED FOR THE

CM COMET

IN EVERY

FOOD PROCESSING PLANT

5 Capacities from ½ ton to 1 ton. Priced from $130.

For the fast and economical overhead handling of foods in processing, the light weight CM Comet electric hoist is outstanding in every way. All working parts are fully enclosed and permanently lubricated... operates on 220 or 440 volt power line or 110 volt lighting circuit... low headroom... one hand control... overload tested ... safety guards... heavy duty motor and controller... Herc-Alloy double duty chain. Get *all* the details of *all* the advantages by writing today for Bulletin No. 138.

CHISHOLM-MOORE HOIST CORP.

Affiliated with Columbus-McKinnon Chain Corp.

General Offices and Factories: 138 Fremont Ave., Tonawanda, N. Y.

Sales Offices: New York, Chicago and Cleveland

THE PERFECT PACKAGE...

"Glass" with Filma-Seal

The Gutmann screw cap and inner Filma-Seal are applied together in one operation.

Filma-Seal

√ tamper-proof
√ leak-proof
√ evaporation-proof
√ moisture-proof
√ dustproof

(Reg. U.S. Pat. Off.)

FERDINAND Gutmann & COMPANY

SINCE 1880

3611 14th AVE., BROOKLYN, N. Y.

ADVERTISERS

	PAGE
• Allegheny-Ludlum Steel Corp.	31
Allis Co., Louis	161-162
• Allis-Chalmers Mfg. Co.	5, 9, 13
American Can Co.	56
American Coolair Corp.	135
American Sales Co.	191
• American Steel & Wire Co.	44
• Anchor Hocking Glass Corp.	157
• Armstrong Cork Co.	99, 100, 129
Baldwin-Duckworth Div. Chain Belt Co.	50
Barnstead Still & Sterilizer Co.	123
Bemis Bros. Bag Co.	22
Brill Equipment Co.	191
Buell Engineering Co.	20
• Buffalo Forge Co.	167
Buffalo Wire Works Co.	116
Bump Pump Co.	106
Burkhard, Inc., Thos.	191
Cardox Corp.	156
Carpenter Steel Co.	46
Carnegie-Illinois Steel Corp.	44
Century Electric Co.	41
• Cherry-Burrell Corp.	14
Chisholm-Moore Hoist Corp.	192
Chisholm-Ryder Co., Inc.	184
Cleaver-Brooks Co.	151
Columbia Steel Co.	44
Consolidated Packaging Machy. Corp.	170
Consolidated Products Co.	191
Consolidated Siphon Supply Co.	184
Container Corp.	28
Continental Can Co.	19
• Corn Products Co.	147
• Corning Glass Works	33
Creamery Package Mfg. Co.	36
Crocker Wheeler Electric Mfg. Co.	27
Crown Can Co.	126
• Cyclone Fence Co.	172
Damrow Bros. Co.	154
Darnell Corp., Ltd.	139
Dewey & Almy Chemical Co.	38-39
• Dexter Folder Co.	158
Diamond Crystal Salt Co.	132
Distillation Products, Inc.	144
• Dobeckmun Co., The	25
• Dodge & Olcott Co.	150
Dole Refrigerating Co.	174
Enterprise Mfg. Co.	128
Eppenbach, Inc.	133
• Fairbanks, Morse & Co.	120
Felton Chemical Co.	150
Ferry Co., J. D.	114
Filtrine Mfg. Co.	148
First Machinery Corp.	189
• Florasynth Laboratories, Inc.	150
Food Industries Catalog & Directory	168-169
Food Research Laboratories	108
Foster-Forbes Glass Co.	177
Foxboro Co.	26
Frederick Iron & Steel Co.	116
• Fritzsche Bros. Inc.	146
Gair Co. Inc., Robt.	30
• Gardner-Richardson Co.	17
Gelb, R., & Sons, Inc.	190
• General Electric Co.	173
General Electronic Industries (Auto Ordnance Div.)	21
General Motors Truck Co.	166
• Globe Stainless Tube Co.	52
Greer Co., J. W.	47
Gruendler Crusher Co.	182
• Gump Co., B. F.	138
Gutmann & Co., Ferdinand	192
Heller Co., Walter E.	40
Hersey Mfg. Co.	12
• Hoffmann-LaRoche, Inc.	102
Horne-Ash Machy. Co., Inc.	190
Howell Electric Motors Co.	15
• Howes Co., Inc., S.	193
Hunter Machine Co., James	18
Illingworth Engrg. Co.	190
• Ingersoll-Rand Co.	48
Ingersoll Steel & Disc Div., Borg-Warner Corp.	23
International Foodcraft Corp.	188
Iron & Steel	191
Island Equipment Corp.	172
Jenkins Bros.	29
• Johns-Manville Corp.	180
Kehoe Machy. Corp., Lester	190
Kinetic Chemicals Co.	183
• Koven & Bros. Inc., L. C.	174
Lamson Corp.	111
LaPorte Nat. & Mfg. Co.	182
Leberco Labs.	134
• Leeds & Northrup Co.	4
Lewis Co., D. B.	190
Lincoln Engineering Co.	164
• Link-Belt Co.	7
Liquidometer Corp.	166
Loeb Equipment Supply Co.	190
Lubriplate Div., Fiske Bros. Refining Co.	159
Lunkenheimer Co.	117
Machinery & Equipment Corp. (New York City)	190
Machinery & Equipment Co. (San Francisco)	191
Master Electric Co.	35
• Mathieson Alkali Works	140
Mazzola Chas. L.	148
McGraw-Hill Book Co.	122
Menasha Products Co.	194
Mercer-Robinson Co.	135
• Merck & Co., Inc.	142
Mercoid Corp.	184

IN THIS ISSUE

	PAGE
Meyercord Co.	141
Milprint, Inc.	45
• Mixing Equipment Co.	175
Modine Mfg. Co.	165
Murray Mfg. Co.	16
• Nash Engineering Co.	97
National Aniline Div., Allied Chem. & Dye Corp.	145
• National Can Corp.	152-153
National Starch Products, Inc.	149
National Tube Co.	44
Niagara Blower Co.	170
• Nutritional Research Associates, Inc.	148
• Oakite Products, Inc.	109
• Orr & Sembower, Inc.	158
• Package Machinery Co.	105
Paisley Products Inc.	179
Parker Rust Proof Co.	Third Cover
Patterson-Kelley Co., Inc.	124
Perry Equipment & Supply Co.	190
• Pfaudler Co.	181
Philadelphia Quartz Co.	138
• Pneumatic Scale Corp Ltd.	8
• Porter Co., Inc., H. K.	Second Cover
• Powers Regulator Co.	148
• Premier Mill Corp.	154
• Pressed Steel Tank Co.	107
• Pulverizing Machinery Co.	180
Quaker City Cold Storage Co.	148
Reeves Bros., Inc.	112
Republic Steel Corp.	10-11
Reynolds Metals Co., Inc.	34
Rhinelander Paper Co.	42
• Riegel Paper Co.	163
Robbins & Myers, Inc.	126
Ross & Rowe, Inc.	134
• Rossotti Lithographing Co.	101
Ryerson & Son, J. T.	193
St. Regis Paper Co.	49
• Sarco Company	174
Savage Bros. Co.	191
Schwarz Laboratories, Inc.	148
Seedburo Equipment Co.	112
Snell, Inc., Foster D.	148
• Sparkler Mfg. Co.	170
Spencer Lens Co.	172
Staley Co.	51
Standard Conveyor Corp.	113
Stecher-Traung Lithograph Corp.	55
Stein Hall & Co., Inc.	148
• Stephens-Adamson Mfg. Co.	171
Sutton, Steele & Steele, Inc.	118
• Swenson Evaporator Co., Div. of Whiting Corp.	43
Sylvania Industrial Corp.	155
Syntron Co.	180
Tanglefoot Co.	166
Taylor Instrument Cos.	160
Texas Co.	Back Cover
Timken Roller Bearing Co.	32
Tip Top Co.	190
Trailer Co. of America, The	54
Traver Co.	53
Twitchell, Inc., E. W.	110
Union Iron Works.	115
Union Special Machine Co.	164
Union Standard Equipt. Co.	190
• U. S. Steel Corp.	44
• Universal Cooler Corp.	187
Van Brode Milling Co.	190
Van Heeden, Arthur	148
Viking Pump Co.	108
Vilter Mfg. Co.	127
Viobin Corp.	148
• Vitamins Inc.	148
Walworth Co.	185
Wickwire Spencer Steel Co.	37
• Worthington Pump & Machinery Corp.	6
York Corp.	24

• For further detailed information regarding this company's products see the 1943

FOOD INDUSTRIES
CATALOGS & DIRECTORY

Materials for the Food Manufacturer—148

•

PROFESSIONAL SERVICES—148

•

STORAGE, Frozen Foods—148

•

WHERE TO BUY—148

•

SEARCHLIGHT SECTION
Classified Advertising

BUSINESS OPPORTUNITIES	188
EMPLOYMENT	188
USED EQUIPMENT	188-191
WANTED TO PURCHASE	188

RYERSON STEEL IN STOCK

Call Ryerson when you need steel — any kind, shape, or size. Large stocks are available at ten convenient plants. Ask for a Ryerson Stock List — your guide to prompt shipment of steel.

Principal Products Include:

Bars • Shapes • Structurals • Plates • Sheets • Floor Plates • Alloy Steels • Stainless Steel • Shafting • Screw Stock • Wire • Mechanical Tubing • Boiler Tubes • Reinforcing Steels • Tool Steels • Babbitt • Nuts • Bolts • Rivets • Welding Rod • Etc.

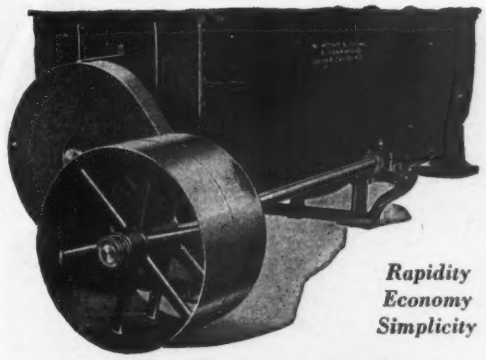
JOSEPH T. RYERSON & SON, Inc.

Plants at:

CHICAGO, MILWAUKEE, ST. LOUIS, CINCINNATI, DETROIT, CLEVELAND, BUFFALO, BOSTON, PHILADELPHIA, JERSEY CITY.

EUREKA

'Even-mix'



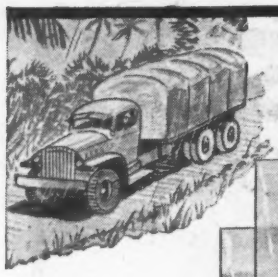
Rapidity
Economy
Simplicity

PRECISION BLENDING

Infinitely uniform mixing—at exceedingly large capacity—at extremely small expense for power, labor's attention and upkeep . . . 'Even-mix', America's most modern and best built Mixers, offer unparalleled simplicity, safety and economy in blending dry or semi-dry materials . . . A size to suit every need.

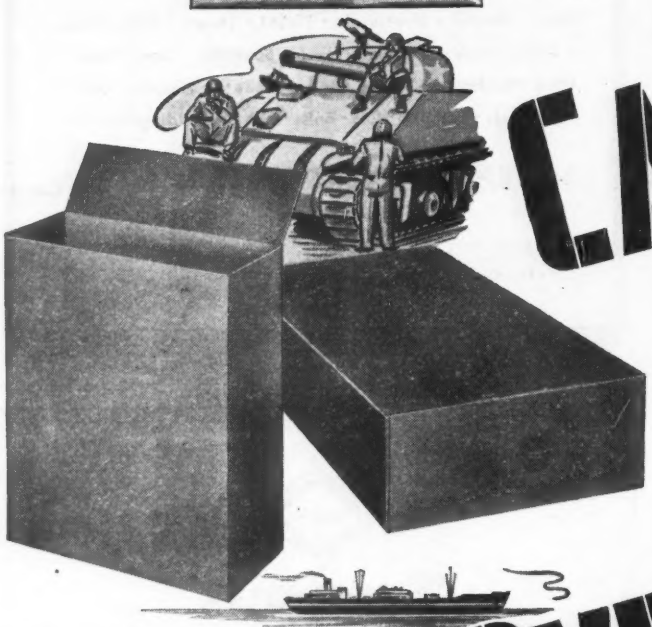
Ask for Catalog I-165

S. HOWES CO., INC., Silver Creek, N. Y.



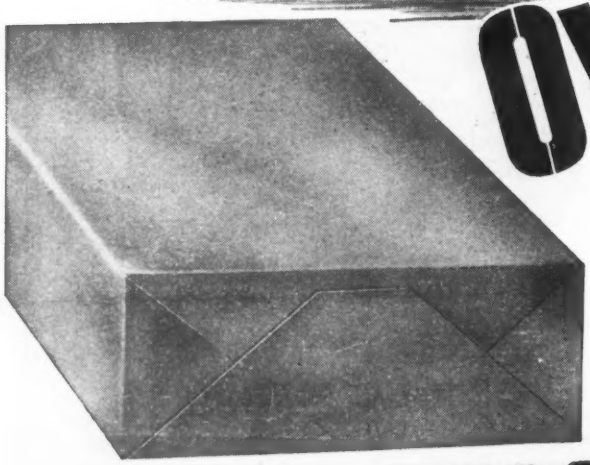
BAGS

What are your bag-packaging requirements? Menasha works in a great range of papers — single, laminated and coated sheets. A number of today's best-known war foods are going safely overseas in Menasha bags.



CARTONS

And your carton requirements? Protection against gain or loss of moisture, against sifting, grease penetration and insect infestation are "built-in" properties of millions of Menasha war goods cartons.



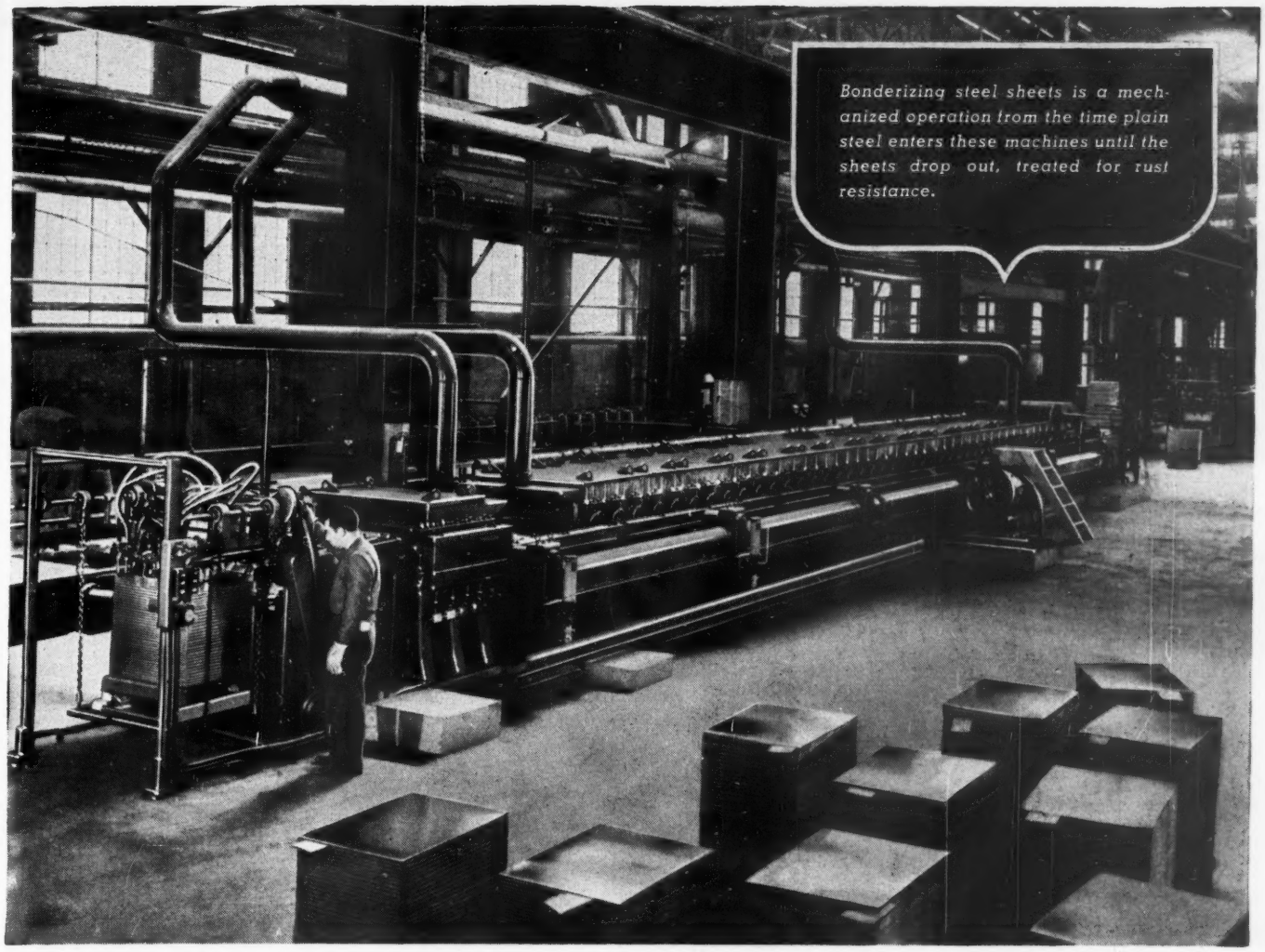
OVER-WRAPS

Over-wrapping fits readily into production. The required degree of protection and proper resistance to handling can be "built-in" to the single and laminated over-wraps made by Menasha.

THE MENASHA PRODUCTS CO.
Division of Marathon Paper Mills Co.
MENASHA, WISCONSIN

MENASHA PRODUCTS

CARTONS, LINERS
BAGS AND OVERWRAPS


Bonderizing steel sheets is a mechanized operation from the time plain steel enters these machines until the sheets drop out, treated for rust resistance.

Chemistry Created Bonderized Steel Sheets

to take a vital part in winning the war

Canned food is of vital importance in both military and civilian life, and the economical packaging of our critical food supply is one of our pressing problems. An important contribution toward its solution was the creation of the Bonderized steel sheet—a new material for the production of cans, containers and closures. While this material had its inception in the Parker research laboratories, it took the close cooperation of the technical staffs of the leading can manufacturers and steel mills to quickly make it a practical commercial product. Countless detailed problems had to be faced and licked by this team.

For months now American steel mills have been turning out tons of Bonderized steel sheets for the can and container industry. This is a new, useful manufacturing material. It has the strength of steel, rust resistance, excellent enamel adhesion, and the forming and other manufacturing qualities necessary to its practical commercial use.

War stimulated the development and application of Bonderized sheet steel —but it will remain long after the war as a useful packaging and closure material, because of proven valuable characteristics.

PARCO LUBRIZING

Parco Lubrizing is a chemical treatment for iron or steel friction surfaces, in mechanical assemblies, that improves bearing properties, and retards wear.

BONDERIZING

Bonderizing is a chemical treatment for iron, steel, or zinc that insures cohesion of applied coatings of paint, enamel or lacquer, resulting in longer-lived, rust-resistant finish.

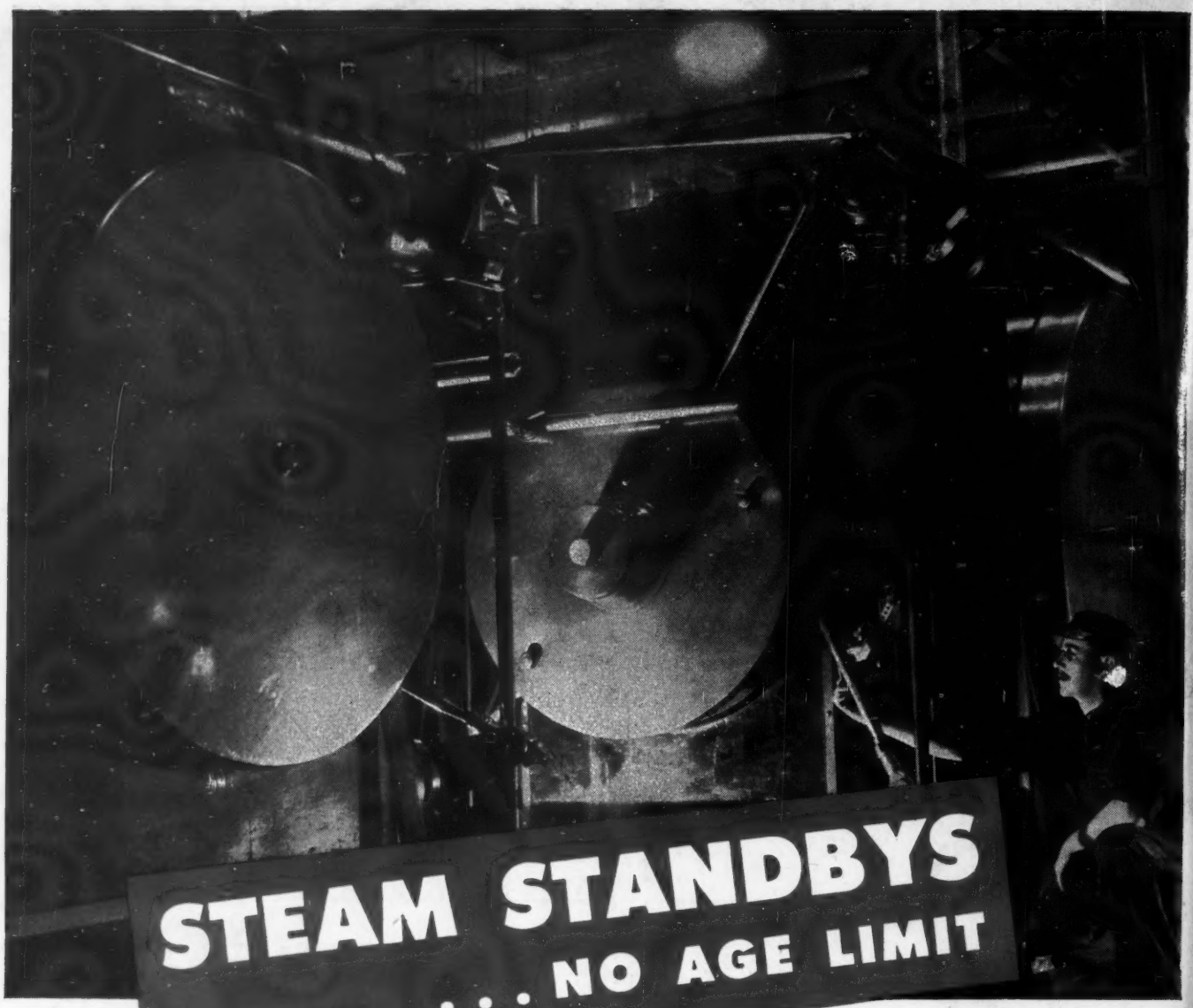
PARKERIZING

Parkerizing is a chemical treatment for iron or steel, resulting in a surface that can be stained, oiled, waxed or painted and is substantially resistant to rust.

PARKER RUST PROOF COMPANY

2165 E. MILWAUKEE AVE., DETROIT 11, MICHIGAN

PARKER PRODUCTS CONQUER RUST



STEAM STANDBYS ... NO AGE LIMIT

AMERICA'S urgent wartime call for more and more power has taken the "wraps" off reciprocating steam engines that haven't turned a wheel in years.

In keeping many of these old-timers on the job, Texaco is playing a vital part.

In engines old or new and whatever the steam temperature or pressure, *Texaco Steam Cylinder Oils* atomize completely, adhere to cylinder walls, separate rapidly from exhaust; assure quiet operation and low oil consumption.

A Texaco Lubrication Engineer is at your service to assist in selecting the most suitable oil for your service. They are available through more than 2300 Texaco distributing points in the 48 States. The Texas Company, 135 E. 42nd St., N. Y. 17, N. Y.

THEY PREFER TEXACO

★ *More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.*

★ *More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.*

★ *More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.*

★ *More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.*

★ *More revenue airline miles in the U. S. are flown with Texaco than with any other brand.*

TEXACO

TEXACO Steam Cylinder Oils

FOR EVERY STEAM CONDITION

TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT—CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY